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Coal-Dust Fuel.

In No. 1 of our present volume we gave the report of the Committee on Science and Arts of the Franklin Institute on the artificial fuel prepared by Mr. E. F. LOISEAU, of Philadelphia, and a few remarks of our own, in which we expressed a desire to be more fully informed as to the economy of production of this fuel.

Mr. LOISEAU has had the kindness to respond to this wish of ours by sending us his estimate, which he bases on the market value of the materials required, assuming that the necessary labor can be performed here at three times the cost of the same in certain Belgian establishments.

According to Mr. L. GRUNER, Chief Engineer of Mines in France, "coal-dust mixed with clay has been manufactured by machinery since 1861 at Tamines sur Sambre and at Ham sur Sambre, Belgium." This business was started at Tamines sur Sambre by Mr. SIMEON BAUDRY, and although this gentleman uses 20 per cent. of clay, and his fuel is subject to disintegration by rain, he has been compelled to increase his production from year to year, and now furnishes 400 tons per day.

The cost of manufacture there, according to Mr. LOISEAU, who has resided for several years in the place, is seventy centimes, or *fourteen cents*, per ton.

For this country Mr. LOISEAU estimates the cost of his fuel (which has the advantage of not suffering from rain) as follows:

Labor	$0 45
Coal-dust at the mines	0 05
Clay (7 per cent.)	0 05
3 gallons of Benzine, bought in tanks (not barrels) at 7 cents per gallon	0 21
18 lbs. of rosin, No. 3, at 1c. per lb	0 18
Incidental expenses	0 06
Total cost per ton of fuel	$1 00

This is considerably below the cost of mining a ton of coal; and if actual experience should sustain the estimate, this method of utilizing coal-dust will undoubtedly come into extensive application.

Technical Lectures.

THE following course of lectures will be delivered at the dates specified, in the Lecture Hall of the Stevens Institute of Technology, in Hoboken. As a consideration of the subjects enumerated will show, they are intended for the benefit of men of science and those interested in the special subjects of mechanical and civil engineering, and are not expected to prove attractive to a general audience. The names of the lecturers are a sufficient announcement of the interest and value of the information which will be conveyed, and the subjects will be very fully illustrated by general and detailed drawings.

Lecture I.—By Mr. A. L. HOLLEY, C. E., on "Bessemer Machinery." Tuesday, February 6th.

Lecture II.—By Mr. A. L. HOLLEY, C. E., on "Modern Rolling Mill Machinery." Thursday, February, 8th.

Lecture III.—By Prof. J. E. HILGARD, on "Methods of Precision in Weighing and Measuring." Friday, February, 16th.

Lecture IV.—By Mr. COLEMAN SELLERS, on "Transmission of Motion." Monday, February, 19th.

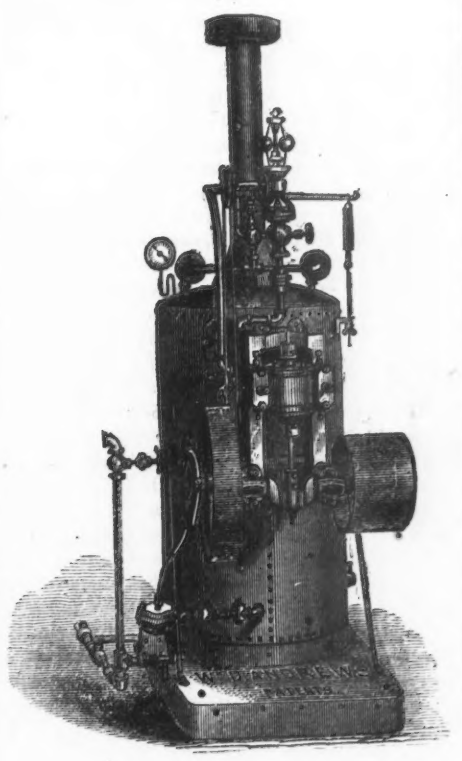
Lecture V.—By Prof. R. H. THURSTON, on "The History of the Steam Engine and the Direction of its Future Development." Thursday, February, 22d.

Lecture VI.—By Prof. R. H. THURSTON, on "The History of the Steam Engine and the Direction of its Future Development." Tuesday, February, 27th.

The tickets for the course are only one dollar, single tickets, twenty-five cents.

Andrew's Patent Portable Engine.

WE illustrate this week another of the portable engines which are so convenient where small power is required. Each engine is furnished with governor and steam gauge, a band pully and balance wheel, check valves, and all necessary pipes, cocks, valves, grate bars, fire irons, etc., of good workmanship and in running order. As the foundation frame and connection of the engine to the boiler are all of wrought iron, they are light, strong and durable; they occupy very little room, and require only a trifle of care.



PORTABLE STEAM ENGINE.

In ma hines of this style, from ½ to 10 horse power the boiler is of the cone pattern, without tubes, the internal shape of which gives ample steam room with a moderate water space. W. D. ANDREWS & BRO., 414 Water street, will be pleased to furnish further information, on application.

Notes on Lead Smelting in Nevada and Utah.

BY O. H. HAHN, M. E.

(Continued from page 34.)

IF wall-accretions have increased to such an extent that they cannot be removed without the greatest difficulty; if the charges descend irregularly, in spite of being decreased; and if the furnace walls show unmistakable signs of destruction, it is advisable to *blow out* the furnace. The charge is allowed to go down to the tuyeres, the furnace emitting thick lead fumes and a blaze. As soon as the charge has arrived at the tuyeres, the blast is shut off, and all the loose masses are drawn out of the furnace. Then the tap-hole is opened with a sharp-pointed bar, and the liquid contents of the furnace are discharged into the lead-well, which has been previously heated. The stuff remaining in the furnace, consisting of congealed slag and matter is detached with bar and sledge. The breast is only removed when needing repairs. After cooling, which usually takes thirty-six hours, the furnace is freed from wall accretions, and the injured places are repaired. The hearth and boshes are relined with English fire-bricks, and a new dam and bottom are tamped in. In the syphon-tap only the basin needs repairing. The inside of the tuyeres must be cleared from sediment before they are ready for service again. A furnace, if badly burnt out, can be in running order within a week's time.

Furnace No. 5 was lighted up for the first time, on May 31, 1871, and made three runs of respectively 26, 45 and 50 days, together, 121 days, without ever being repaired. It was only blown out in consequence of repairs not connected with the furnace.

In the three small furnaces the proportion of coal to coarse ore is as 1: 3.75, to fine ore as 1 :4.6 by weight. The quantity of ore run through in 24 hours is, for coarse ore, 20 tons; for fine, 26 tons, with an average consumption of 33 bushels of coal per ton of ore. The four furnaces constantly in use smelt at present 115 tons of ore per day, yielding from 14 to 24 tons of lead. They consume on an average 4,040 bushels of coal. The ore assays on an average $27 in silver, and $35 in gold. The lead-assays have been discontinued as being unimportant. Daily 120 tons of ore are delivered by teams from the company's mines. It is dumped in front of the feeding floor. The coarse pieces are picked out and run through the crusher, while the fine ore is wheeled directly to the furnaces. Generally charges of coarse ore alternate with such of fine; only when the furnace is deranged the latter is given in preference.

The charcoal is piled up in the open air in a place elevated some distance above the roof of the feeding floor. Trestle works with car tracks connect the latter with the former. Every furnace has a compartment of its own for the coal. It is conveyed

from the pile in cars holding 20 bushels, and dumped into chutes leading to the bins. There is always a 30 days' supply, viz.: 120,000 bushels kept on hand.

The dross and waste of the coal is about 10 per cent. The laboring time at a furnace is divided into three shifts of eight hours. The crew for *one* shift consists

I.—At a large furnace (No. 4 and 5) of—
1 smelter at $4 50 per day.
2 helpers at $4 00 "
2 feeders at $4 00 "

II.—At a small furnace, of—
1 smelter,
1 helper,
1 feeder.

Two foremen, at $6 per day, have the immediate supervision of the furnace hands. They change every 12 hours. Two machinists at $5, under the supervision of a chief engineer at $8, take care of the engine. Besides, there is a blacksmith, and outside foreman, and a number of roust-abouts adequate to the wants of a large establishment. At the head there is a metallurgist, who reports to the general superintendent.

The products obtained in smelting are:

1. *Silverlead*, generally called base bullion, with from $250 to $400 in gold and silver, about one-half of the value being gold. As it is not advantageous to treat it any further on the spot—the owner losing at least the difference in the cost of labor between here and city refinery—it is shipped to Newark, N. J. The expenses of shipping to San Francisco, thence by sailing vessel to Newark, and the cost of parting, amount to $69 gold.

There were produced at the Eureka Consolidated Company's works, during the time from January 1st to October 1st, a. c. 3,800 tons of bullion from 17,000 tons of ore at a cost of about $39 per ton, all told.

2. *Matte*, or rather a mixture of matte and speise, that is sulphurets and arseniurets of iron, with 90 per cent. of iron and from $12 to $15 in gold and silver. It is thrown over the dump as worthless under the present circumstances. Its color is yellowish-white, like that of marcasite, with a blue taint at the surface; its texture is radial; spec. gravity 4.02. It is produced in the proportion of 2 to 4 bullion. Sometimes this proportion is larger.

3. *Slag*. It is a mixture of singulo—with subsilicates. It shows only traces of gold and silver by either crucible or scorification assay, and has a specific gravity of 3·6. About 10 or 12 per cent. are used over again, the rest is thrown over the dump.

Its composition is shown by the following analyses:

	I. (thin.)	II. (thick.)	III.
SiO_3 =	26.12	37.50	30.20
FeO =	52.80	50.70	50.60
PbO =	2.79	8.00	8.70
Al_2O_3 =	5.80	—	3.01
CaO =	12.00	2.80	7.10
			0.90 MgO
	99.51	99.00	100.51

I. and II. are analyses made by ARENTS from recent slags; III. by KÜSTEL from former ones.

Wall-accretions, principally sulphurets of lead and arsenic, with about $10 in silver and traces of gold. These are thrown over the dump. They crystallize in small cubes, and have metallic lustre and blue color.

Hearth-accretions and *furnace-scrapings*, semi-fused slags, etc., are likewise thrown away.

Dust, assaying about the same as the ore, is a mixture of coal-dust with the finest particles of ore. Its percentage is considerable, but cannot be accurately ascertained without attaching dust-chambers to the furnaces. It would be well for a large company like the Eureka Consolidated to do this.

The principal loss, however, is not in the dust, but in the matte. The yield of precious metals is 93 per cent. of the fire assay, reduced to dry ore.

The theory of this smelting process is easily explained. Under the influence of heat the carbonates first lose their moisture and carbonic acid. The remaining oxide of lead unites with the silica present to silicate of lead. The limestone also loses its carbonic acid, thereby becoming a base which has a stronger affinity for silica than oxide of lead. The oxide of iron is reduced to protoxide by means of heat and the reducing power of carbonic oxide from the fuel. The consequence is that we obtain silicate of iron and lime, and oxide of lead which yields to the reducing action of carbonic oxide, and forms metallic lead. If there is an excess of limestone or oxide of iron, a portion of protoxide of iron, being a weaker base than lime, will remain uncombined, and then will be reduced to metallic iron. Sulphuret of lead in contact with oxide of lead (according to the formula $2\,Pb\,O + Pb\,S = 3\,Pb + SO_2$) form metallic lead while sulphurous acid is disengaged. In the presence of oxides of iron a portion of the latter is reduced to metallic iron, which, in its turn, decomposes with the sulphuret of lead to sulphuret of iron and metallic lead. These reactions with sulphur and iron are less complete in the presence of silver than of lead, owing to the great affinity between silver and sulphur, which causes more or less silver to remain in the matte or iron sulphuret.

Arseniates of lead acted upon by coal in the heat yield arseniuret of lead, arsenious acid, carbonic acid, and metallic lead. The arseniuret of lead is again decomposed by metallic iron, forming an arseniuret of iron or *speise* and metallic lead.

The next works at Eureka deserving attention are those of the Richmond Company, lately passed into English hands, at the southeastern end of the town. They were originally erected by Messrs. Ogden, Dunne & Co., for the purpose of doing custom work, But the scarcity of real lead ores offered for sale induced these gentlemen to abandon this scheme and consolidate with the owners of the Richmond, a very valuable mine adjoining those of the Eureka Consolidated Company on Ruby Hill. The ores resemble in their character those of the latter company, being bog ores, intermixed with gold and silver-bearing lead ores. On an average they yield by fire assay $40 in gold and silver, and produce, when mixed with about seven per cent. of quartzose silver ore, (milling ore), a bullion of $250 per ton, which is shipped to San Francisco for parting, at a cost of $35 per ton. At present the company have a circular furnace of the Piltz pattern, with seven two-inch tuyeres, mechanical feeder and syphon-tap running; but there are two more large furnaces, designed by Mr. Arents, in the course of construction, each of which will reduce 50 tons of ore per day. In addition, there is a German cupelling furnace of ten feet diameter, a softening or calcining furnace, and a bullion melting furnace, which are out of use at present. The steam engine is a vertical one, of 35-horse power, with one boiler only, which drives a No. 7 Sturtevant blower, a Blake's 10x12-inch crusher, a Howland crusher and a Harrison burr-stone mill. The Blake's crusher is destined to break up the coarsest lumps of ore. The Howland crusher and the Harrison mill are only used for sampling purposes and grinding sandstone, clay, &c. The former reduces the material to pea-size, after which it goes to the mill to be ground to a fine pulp.

The arrangement for getting coal to the smelting furnace is substantially the same as that at the Eureka Consolidated Works. There is a magnificent ore floor, built of stone, attached to the works, where the winter supply of ore is piled up. The feeding floor is spacious, and contains a number of bins to keep different ores separate.

Lately the charge was as follows:

17 large shovels of charcoal = 90 lbs., or ca. 5 bshls.
24 shovels of Richmond ore @ 15 lbs. = 360 lbs.
2 shovels of milling ore @ 12 lbs. = 24 lbs.
384 lbs.
2 shovels of slag @ 17 lbs. = 34 lbs.
418 lbs.

This is at the rate of 1 lb. of coal to 4.6 lbs. of smelting mixture, or 4.2 lbs. of ore, or 26 bushels of coal to 1 ton of ore. There are passed through the furnace 150 charges in 24 hours, equal to a capacity of 28.8 tons of ore. The yield in the bullion I cannot give, but the ore, I am told, worked $64 per ton during the month of October. Run: from three to four weeks. The proportion of matte produced along with the bullion is about the same as at the Eureka Consolidated Works. The wall-accretions are more troublesome than in the former works, as the mechanical feeder prevents their detachment. The slag is basic and resembles No. 1, heretofore described.

The works of the Phœnix Company do not present any new feature. They have a small Raschette furnace of 25 tons capacity, built by Charles Liebenau, running, and another one in the course of construction. The company's mines are in three different ore zones, viz.:

1. That of the bog ores (Jackson mine, mines on Ruby Hill).

2. That of the dry, or milling ores (mines on Adams Hill), auriferous silver ores, with little or no lead.

3. That of the lead ores (Bullwhacker mine). The latter are rich in lead, with a moderate yield in silver and no gold.

The ores of the variety No. 1 are very basic and require an admixture of quartzose material for smelting. This is accomplished by adding the ores of the varieties Nos. 2 and 3.

The bullion yield is four tons per day, assaying $210 in silver and $40 in gold per ton. There is no, or very little, matte produced, owing to the lack of sulphurets in the ore. Wall-accretions do not occur. The furnace looks perfectly clean after blowing out, but the slag is of a more basic character than No. 1 of the Eureka Consolidated Company's Works, hence the walls round the tuyeres are very rapidly destroyed. Run: 21 days.

Besides these establishments there are a great many smaller ones in Eureka district, which run only at intervals.

Southwestern Items.

ATLANTA, Jan. 10, 1872.

TO THE EDITOR: Sir—In the generally prosperous condition of the States of Virginia, Tennessee and Georgia, there seems to have been but little change within the past two years. The coal and iron lands on the Alabama and Chattanooga Railroad are attracting much attention. You have recently published some description of parts of this wonderfully rich region.

In gold mining in this State almost nothing is being done. A small operation near Grantville has just resulted disastrously to the parties interested. The character of the auriferous deposits in this mineral country is such as to render their working an exceedingly dangerous business. Some of us have proved this fact to our complete satisfaction. There is, however, just gold enough in some places to make the prospect appear very attractive at the outset, and there are also, perhaps, good mines in this section, which may eventually be developed by some one of the thousands who are not willing to be warned by the experience of their predecessors.

The Tennessee coal mines seem to be in a prosperous condition. Coal from the mines of the Coal Creek Coal Company is the favorite in this market; and from the specimens which I have seen, I judge that its good reputation is well deserved. It is sufficiently compact to reach the market in good-sized lumps; and it contains a much smaller proportion of pyrites than the coal from other localities which is sent here, usually in small pieces and mixed with a considerable quantity of dust.

I shall endeavor to obtain some further information regarding gold mining, which I will communicate to you if I succeed in my attempt. W. P. W.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

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RULES:

ADOPTED MAY 16TH, 1871.

I. The objects of the American Institute of Mining Engineers are to enable its members, comprising mining engineers and other persons interested in mining and metallurgy, to meet together at fixed periods for the purpose of reading papers upon and discussing subjects which have for their aim the economical production of the useful minerals and metals, and the safety and welfare of those employed in these industries, and to circulate among its members, by means of its publications, the information thus obtained.

II. The Institute shall consist of Members, Honorary Members and Associates. Members and Honorary Members shall be mining engineers. Associates to include other persons interested in mining and metallurgy. All these classes shall be equally entitled to the privileges of membership except as hereinafter provided.

III. The annual subscription of each member and associate shall be ten dollars, which shall be payable in advance at each annual meeting or immediately after his election.

IV. Any member who shall make a donation of

one hundred dollars, or upwards, shall become a Life Member, and any associate who shall make a like donation shall become a Life Associate, and shall not be liable for any further annual subscription.

V. Honorary members shall not be called upon to pay any annual subscription. The number of honorary members shall not exceed twenty.

VI. Persons desirous of becoming members or associates of the Institute shall be proposed by at least three members or associates, approved by the Council and elected by ballot at a regular meeting upon receiving at least three-fourths of the votes cast.

VII. Every person proposed as an honorary member shall be recommended by at least ten members of the Institute, approved by the Council and be elected by ballot on receiving nine-tenths of the votes cast.

VIII. The officers who shall constitute a Council for the direction of the affairs of the Institute, shall consist of a President, who shall be a mining engineer, six Vice Presidents, at least four of whom shall be mining engineers, (the words "mining engineers" in these rules comprehend engineers connected either with mining or metallurgy,) nine managers, at least six of whom shall be mining engineers, a Secretary and a Treasurer. All of these officers shall be members or associates of the Institute and shall be elected at the annual meeting, (except in cases of vacancies), and shall be eligible for re-election, with the exception of any President or Vice President who may have held office for the three immediately preceding years, and such two Managers of the mining engineers and one other Manager who shall have attended the fewest Council meetings during the past year; but such members shall be eligible for re-election after being one year out of office; and such election shall be made in the manner following: A—Any member of the Institute shall be at liberty to nominate in writing, and send to the Secretary, not less than thirty days prior to the annual meeting, a signed list of such persons as are considered suitable to fill the various offices; which list, having been duly stamped with the Institute seal, together with the list of such officers as shall be eligible for re-election, and a copy of this rule, shall be posted at least ten days previous to the annual meeting to all members of the Institute, who must strike out or add to such list so as to leave a record of their votes for Officers, not exceeding the number to be elected; but nothing shall prevent any member nominating in writing subsequently (specifying the classes as aforesaid), and up to, and on the day of, and prior to the election taking place, any other member or members to fill the various offices, nor shall anything prevent the members, whether present or absent, from having power to vote for any other member or members, although he may not be nominated as before provided for. The voting papers, being so filled up, must be returned through the post, addressed to the Secretary, or be handed to him or to the Chairman, in all cases so as to be received before the hour fixed for the election of Officers. B.—The Chairman shall, in all cases of voting, appoint Scrutineers of the Lists, and the scrutiny shall commence on the conclusion of the other business of the meeting, or at such other time as the Chairman may appoint. On the conclusion of the scrutiny the voting papers shall be destroyed, and the List, prepared and verified by the scrutineers, shall be kept until the next annual meeting. C.—In the event of any vacancies occurring in the number of officers subsequent to the annual meeting, such vacancy or vacancies shall be filled by the Council. D.—At meetings of the Council five shall be a quorum.

IX. General meetings of the Institute shall take place on the 3d Tuesday of February, May, August, and November, and the May meeting shall be considered the annual meeting, at which a report of the proceedings of the Institute and an abstract of the accounts shall be furnished by the Council. Special meetings may be called whenever the Council sees fit; and the Secretary shall call a special meeting on a requisition signed by fifteen or more members. The notices for special meetings shall state the business to be transacted, and no other shall be entertained.

X. Every question which shall come before any meeting of the Institute shall be decided by the votes of the majority of the members then present.

XI. The funds of the Institute shall be deposited in the hands of the Treasurer and shall be disbursed by him according to the directions of the Council.

XII. All papers sent for the approval of the Council shall be accompanied by a short abstract of their contents.

XIII. The Council shall have power to decide on the propriety of communicating to the Institute any papers which may be received and they shall be at liberty, when they think it desirable, to direct that any paper read before the Institute shall be printed in the Transactions. Intimation, when practicable, shall be given at each General Meeting of the subject of the paper or papers to be read and of the questions for discussion at the next meeting, and notice thereof shall be posted to all members. The reading of papers shall not be delayed beyond such hour as the President shall think proper, and if the election of members or other business shall not be dispatched soon enough, the President may adjourn such business until after the discussion of the subject for the day.

XIV. Members elected at any meeting between the Annual Meetings shall be entitled to all papers issued that year.

XV. The copyright of all papers communicated to and accepted by the Institute shall be vested in it, unless otherwise agreed upon between the Council and the author; and such communications shall not be published for sale or otherwise without the permission of the Council.

XVI. All proofs of discussion forwarded to members for correction must be returned to the Secretary not later than seven days from the date of their receipt, otherwise they will be considered correct and printed.

XVII. The Institute is not, as a body, responsible for the facts and opinions advanced in the papers which may be read, nor in the abstracts of the conversations which may take place at the meetings of the Institute.

XVIII. The author of each paper read before the Institute shall be allowed twelve copies of such paper (if ordered to be printed) for his own use, and shall have the right to order any number of copies at the cost of printing and paper, provided they are not intended for sale.

XIX. Any member of the Institute shall have power to introduce a stranger to any meeting, but the latter shall not take part in any discussion without the consent of the meeting.

XX. Any member who has not paid his subscription for the space of one year after it is due, shall not be entitled to vote at elections, or to receive a copy of the Transactions of the Institute.

XXI. The place of holding the general meetings for the ensuing year shall be fixed at each annual meeting, by a vote of the Institute; or, in default of such determination, by the Council. The place for special meetings shall be fixed by the Council; and notice of all meetings shall be given by mail or otherwise to all members and associates, at least twenty days before the time appointed for said meeting.

XXII. No alteration shall be made in any of the Laws, Rules or Regulations of the Institute except at the annual meeting.

Announcements to Members and Associates.

I.—PERSONS noticing any errors in name or address in the foregoing list, are requested to inform the Secretary at once.

II.—It is believed that several names of members and associates elected at the Bethlehem meeting in August, 1871, have been accidently omitted by reason of the loss of a portion of the records of that meeting. Such persons or their friends are requested to communicate with the Secretary.

III.—All members and associates who have not paid their dues, are requested to do so at once, by sending in postal orders, or check or money, ten dollars to the Secretary.

All members and associates who pay their dues for each current year, strictly in advance, will have sent to their address regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute, and all notices of meetings. Back numbers cannot, as a general rule, be sent.

IV.—It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual, or semi-annual volumes, to which those members and associates will be entitled who have paid their dues.

V.—Authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called in this connection, to rules 12 and 13.

The next meeting of the Institute will be held in Philadelphia, beginning on Tuesday, February 20, 1872, at 8 P.M. The Council will meet at 3:30 P. M. of the same day. Messrs. LESLEY, DROWN, BLANDY, FRASER, GAUJOT and LYMAN are the Local Committee of Arrangements. MARTIN CORYELL, Secretary, Wilkesbarre, Pa.

Lake Superior Iron Product.

THE following tables show the production of iron ore and charcoal pig iron in gross tons during the year 1871, in the county of Marquette, as furnished by the Marquette *Journal*. Both, the iron ore as well as the metal columns, show a considerable increase over the preceding year.

GROSS TONS IRON ORE.

NAME OF MINING COMPANIES.	Shipments by: Mar. & Ont. R. R.	Penn. Div. C. & N. W. R. R.	Other shipments	Total.
Jackson Iron Co.	8,632	121,807	1,858	132,197
Cleveland Iron Mining Co.	47,803	94,865	1,126	142,668
Lake Superior Iron Co.	166,921	....	....	158,147
Iron Cliffs Co { Barnum mine.	....	45,939	....	45,939
Iron Cliffs Co { Foster mine.	....	13,203	....	13,203
Iron Cliffs Co { Red Ore mine.	....	3-9	....	939
Washington Iron Co.	48,725	....	....	48,725
Champion Iron Co.	67,588	....	....	67,588
Pittsburgh and L. A. Iron Co { Edwards mine.	26,437	....	....	26,437
Pittsburgh and L. A. Iron Co { Lake Angeline mine.	948	32,697	2,445	33,646
New York mine.	....	73,936	....	76,381
New England Iron Co.	....	33,359	....	33,359
McComber mine	5,387	10,555	....	15,942
Grand Central mine.	51	2,890	....	2,921
Winthrop Iron Co.	4,479	2,840	....	7,319
Negaunee mine.	44	4,743	....	4,787
Cascade mine.	....	3,719	....	3,719
Harlow mine.	83	....	....	83
Totals.	367,078	440,872	5,429	813,379

PIG IRON.

FURNACES.	Shipments by: Mar. & Ont. R. R.	Penn. Div. C. & N. W. R. R.	Other shipments	
Morgan	4,792	....	....	4,792
Champion	5,094	....	....	5,094
Michigan	4,460	....	....	4,460
Greenwood	4,450	....	....	4,450
Pioneer	146	8,047	....	8,193
Deer Lake	....	2,309	....	2,309
Bancroft	3,850	....	....	3,850
Collins	4,174	....	....	4,174
Bay	....	....	3,597	3,597
Fayette	....	....	8,696	8,696
M. & P. Rolling Mill Co.	....	....	1,610	1,610
Total Pig Iron.	26,966	10,356	13,903	51,220
Total tons Ore and Pig Iron	394,044	451,228	19,332	864,604

THE COAL TRADE.

Anthracite Coals.

NEW YORK, Jan. 19, 1872.

WHOLESALE—The demand continues very slack, with little prospect of change before the next Scranton sale. The Lehigh Co.'s mines are stopped for a few weeks, and sales are made from the stock on hand. The Pennsylvania Co. reports vessels rather scarce to Providence and ports beyond, on account of the disinclination of masters to go round Point Judith. Yet the rates appear to be declining; at least we hear of $1,75 as paid in some cases, while $2,00 and upwards has been demanded in others. The annexed annual circular is published in full, as important and worthy of imitation by other companies.

THE WILKES-BARRE COAL AND IRON COMPANY.

OFFICE, NO. 80 BROADWAY.

NEW YORK, January 17th, 1872.

The Company has decided, in view of the success which attended its circular of the year just closed, to renew the conditions thereto annexed, at prices to be fixed monthly, in offering their production of 1872, as follows:

First.—All orders to be in writing, and they will be entered upon the Company's books, and the parties notified on the 11th day of March, of their acceptance or rejection.

Second—The Coal to be delivered in equal monthly proportions, from April to November inclusive, f. o. b., Hoboken, or Port Johnston.

Third.—The price to be announced about the first of each month by circular, and the contractors to have the right to decline the Coal for any month by giving notice within five days after the date of the Company's circular, without prejudicing their right to their proportion during subsequent months.

Please fill up your order on the accompanying blank; sign and forward the same to this office at your earliest convenience. Respectfully,

JNO. F. WILSON,
Sales Agent.

CONDITIONS FOR SHIPMENT AND DELIVERY OF COAL.

1st. All sales are for cash, payable in New York City funds, within fifteen days after date of shipment.

2d. Every effort will be made by the Company for the fulfillment of its contracts in the delivery of Coal; but if at any time the operations or business of the Company at the mines or on the roads or canals by which it transports Coal to any place where delivery is agreed to be made are partially or entirely interrupted by floods, breaks, accidents, combinations, turnouts, strikes among miners, boatmen, or other employees, or by any casualties of any kind, the obligations of the Company to deliver Coal under its contracts or agreements may, at its option, be canceled, in the same proportion as the Company's ability to deliver is diminished, to the extent of the average daily quantity the purchasers would be entitled to receive under their contracts or agreements during the period of such interruption; and no liability shall accrue to the Company for damage by reason of such non-delivery, or for demurrage of vessels or otherwise.

3d. All Coal shipped by the Company will be carefully weighed by competent and disinterested weighers at the time of shipment. Invoices and Bills of Lading will be made in conformity with such weight, and no claim for short weight will be entertained unless the alleged deficiency, as ascertained by a sworn weigher, has been duly certified to the Company.

4th. Every Contract for the delivery of Coal must stand upon its own merits as regards price, terms, and conditions of sale.

5th. Contracts not transferable except with the assent of the Company in writing.

6th. All Coal for which orders are given must be called for and taken by the purchasers regularly in full equal monthly quantities, during the season, considered as commencing April 1st, and ending November 30th; but no purchaser shall, under any circumstances be entitled to demand or to receive, in any one month, more than a monthly proportion of the different sizes of Coal contained in his order, nor to claim in subsequent months the Coal which should have been previously demanded and taken, unless found consistent with the convenience of the Company to deliver it.

7th. The Company, when requested by purchasers, will use their best efforts to procure vessels for the transportation of Coal; but, as this will be done without charge, the Company will assume no responsibility in connection therewith.

8th. Captains of vessels going to Hoboken or Port Johnston for cargoes, must carry with them an order from one of the Company's officer's in New York, and must report to the Company's Agent, who will load their vessels in turn on taking the berth assigned to them by the dock master. Every exertion will be made to give prompt dispatch, but the Company will not be liable to demurrage, or for any consequences attending unavoidable delay.

9th. The Coal when delivered on board of vessels, or boats or barges, is to be at the risk of the purchaser. Bills of Lading or other regular evidence of shipment to be proof of delivery as regards time and quantity of Coal.

BITUMINOUS COALS.

There is no news of importance in the trade this week. We have received the tables, published below, compiled from official sources, and giving the statistics of the Cumberland coal trade for thirty years past. From the annual report of the Consolidated C., we extract the following interesting figures, showing the extent and progress of the Company's business.

Gross receipts for 1871, including value of coal on hand Dec. 31, or sold and not yet settled for, $3,403,407; total working expenses, $2,688,172; net earnings $715,235, of which $103,110 has been paid out to construction accounts, $193,688 in coupon interest, $68,837 to sinking fund, and $405,000 in the dividend of Dec. 20, by which the surplus of Dec. 31, 1870 was reduced from $182,143 to $126,741. The product of the mines was 505,527 tons for 1871, against 196,311 tons in 1867. The coal mined during the last four years amounts to 1,329,501 tons, and the dividend paid to $555,000, from which it will be seen that 1871 contributes the largest share of production and profit. It is expected that the product of 1872 will not be less than 700,000 tons, and that of 1873 may reach 1,000,0000. The company possesses 8,000 acres, more than one-half of the Cumberland field, and mines somewhat less than one-fourth of the gross production, the remaining three-fourths being divided among 18 other companies, the product of which will be seen in the table.

Anthracite Coal Trade for 1870 and 1871.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending Jan. 13, 1872, compared with the week ending Jan. 14, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R. R†	37,399	518,084	36 626	337,331
Schuylkill Canal	....	.....	....	.....
*Lehigh Valley R. R.	21,109	330,118	56,633	334,262
Lehigh & Sus. R. R.	20,177	51,150	26,740	43,430
Lehigh Canal	....	....	....	....
Scranton North	391	853	12,733	23,039
" South	12	73	48,263	86,196
Penn. Coal Co., rail	825	1,443	15,429	34,222
" " " canal	....	.....	....	....
Del. & Hud. Canal Co.	....	.....	....	....
" " East	10,457	21,457	13,848	21,495
" " West	3,054	6,128	....	5 312
South	....	.....	8,564	14,567
Shamokin	9,637	16,101	6,109	8,566
Trevorton	....	.....	....	....
Lykens Valley Coal Co.	1,606	2,736	62	62
Wyoming South	....	.....	....	....
Wyoming North	....	.....	....	....
P. N. Y. C. & R. R. Co.	2,256	31,344	....	....
Williamstown Col'y	....	.....	....	....
Big Lick Col	2,104	3,009	1,165	1,483
Total	109,027	981,507	226,282	916,985
1870	....	916,985	109,027	
Decrease		65,522		
Increase			117,255	

* These figures are for the week and fiscal period commencing Nov. 30.
† Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1870 and 1871.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Jan. 13, 1872, compared with week ending Jan. 14, 1871.

COMPANIES.	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal	....	.....	....	.....
B. & O. R. R.	11,159	24,457	17,868	34,069
H. & B. T. R. R.	4,253	7,629	7,437	11 790
*Harrisburg & D.	5,842	19,480	9,910	75,841
*L. V. R. R.	....	1,616	....	23,110
P. & N.Y.C. & R. Co.	3,972	25,770	....	....
Cumberl'd Branch Canal	....	.....	....	.....
" Railroad	....	.....	....	.....
Total	25,326	78,952	35,215	144,510
			25,326	78,952
Decrease				
Increase			9,889	65,558

The tonnage of the P. & N. Y. C. & R. R. Co. is included in that of the L. V. R. R. Co.

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending Jan. 13, 1872.

	1872. WEEK.	1872. YEAR.	1871. WEEK.	1871. YEAR.
By Railway	15,429 02	34,221 19	825 06	1,443 02
" Canal	.....			
Total	15,429 02	34,221 19	825 06	1,443 02
Increase 1872.	32,778 17			

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, January 13, 1872.

BY RAILROAD—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair	1,144	00
" Port Carbon	2,667	08
" Pottsville	449	09
" Schuylkill Haven	3,003	16
" Pine Grove	1,145	08
" Tamaqua	20,753	05
" Harrisburg		
" Dauphin		
Total	29,169	06

FOR SHIPMENT BY CANAL.

Passing Frackville Scales		
" Mill Creek "		
" Schuylkill Valley Scales		
" Mt. Carbon "		
" Cressona "		
" Pine Grove "		
" Tamaqua "		
Total		

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	326	09
" Shamokin	2,612	10
" Herndon		
Total	2,968	19

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	206	04
" Lebanon & Pine Grove Branch	196	01
Total	402	05

CONSUMED ON LATERALS.

From Frackville Scales	292	15
" Mill Creek "	547	19
" Schuylkill Valley Scales	49	08
" Mt. Carbon "	225	07
" Cressona "	258	16
" Pine Grove "	178	03
" Tamaqua "	1,231	07
Total	2,773	15

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	170	01
" " Alburtis, "		
" " Oreland, G. & N. Br.	920	14
" " Connecting R. R.		
" " Willow Street R. R.	281	02
Total	1,371	17

BITUMINOUS.

From Harrisburg	9,680	04
" Connecting R. R., G. & N. Br.		
" Junction R. R.	229	11
Total	9,909	15

COAL FOR COMPANY'S USE

Anthracite	6,612	10
Bituminous	276	04
Total	6,888	14

RECAPITULATION

	Total for Week.	Cor. week last year.	Increase & Decrease.
Passing over Main Line and Leb. Val Branch	29,169 06	26,395 08	i 2,773 18
For Shipment by Canal			
Shipped Westward via Northern Central R. R.	2,968 19	6,446 10	d 3,477 11
Shipped West or South from Pine Grove	402 05	444 19	d 42 14
Consumed on Laterals	2,773 15	2,458 00	i 315 15
Lehigh and Wyoming Coal	1,371 17	1,654 12	d 282 15
Total Anthracite paying frgt	36,686 02	37,399 09	d 713 07
Bituminous	9,909 15	5,025 18	i 4,883 17
Total of all kinds paying frgt	46,595 17	42,425 07	i 4,170 10
Coal for Company's use	6,888 14	2,689 03	i 4,199 11
Total Tonnage for Week	53,484 11	45,114 10	i 8,370 01
Previously this year	385,761 08	503,386 14	d 117,624 06
Total to date	439,245 19	548,500 04	d 109,254 05

SHIPPED BY CANAL.

From Schuylkill Haven			
" Port Clinton			
Total Tonnage per Week			
Previously this year			
Total to date	13,355 16	36,225 17	d 22,870 01

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Jan. 13, 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	.....	
By Railroad, East	13,848*	24,495
" " West	....	5,312
" " South	8,564	14,567
Total Tons	22,412	44,374

For the same period last year.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,		
By Railroad, East,	10,457	21,457
" " West	3,054	6,128
" " South		
Total Tons	13,511	27,585
Increase	16,789	

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, Jan. 13, 1871.

	WEEK.	SEASON.
North	47,520 16	82,351 01
South	8,563 17	14 567 04
Total 1872	56,084 13	96,918 05
Corresponding time in 1871:		
North	Suspension.	
South	"	
Total		
Increase North		
Decrease North		
Increase South		
Decrease South		
Total decrease 1872		
Total increase 1872	56,084 13	95,918 06

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending Jan. 13, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	6,526 15	72,801 13
" Hazleton	36,973 03	253,368 18
" Upper Lehigh	34 02	400 15
" Beaver Meadow	16,173 19	82,267 07
" Mahanoy	3,692 10	29,368 18
" Mauch Chunk	87 02	462 10
" Sullivan & Erie	1,284 00	6,403 02
Total Anthracite	64,701 11	395 078 03
Bituminous Coal via P. & N. Y. R. R.		23,149 18
Bituminous Coal from all sources		843 00
Total by rail and canal	64,701 11	419,071 01
Same time last year	25,910 11	385,920 15
Increase	38,791 00	33,150 06
Decrease		
Forwarded East from Mauch Chunk by rail	56,633 08	338,262 10
Same time last year	21,109 02	330,117 15
Increase	35,524 06	8,144 15
Decrease		

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	56,633 08	338,262 10
Forwarded North from L. & B. Junction	6,5.1 14	39 678 08
To N. C. R. R., at Mount Carmel		73 06
To L. & S. R. R. at Packerton for rail	225 14	1,276 02
Delivered at M'h Chunk	16 07	310 11
Delivered on line of road above Mauch Chunk	122 06	3,218 19
Delivered above Mauch Chunk for use of L. V. R.R.	1,202 02	7,656 02
To L. & S. R. R., at Penn Hav., for railroad		3,638 11
Do. for canal		864 07
At M.Chunk for canal		19 17
Total Anthracite	64,701 11	395 078 03
Bituminous Coal		23,992 18
Total all kinds	64,701 11	413,071 01

This report includes all Bituminous Coal carried over the Lehigh Valley and P. & N. Y. Railroads from December, 1st 1870 to date.

Lehigh Coal and Navigation Company.

Report of Coal Transported over the Lehigh Canal and L. & S. Div. of Central Railroad of New Jersey for the week ending Jan. 13, 1872, and for the year 1872.

	WEEK.	YEAR.
Forwarded East of Mauch Chunk by Rail	26,740	43,140
Delivered at and above do.,	1,727	3,065
Forwarded East of do., by Canal		
	28,467	46,495
Corresponding period last year—		
Forwarded East of Mauch Chunk by Rail	20,176	51,550
Delivered at and above do.,	1,824	3,326
Forwarded East of do., by Canal		
	22,001	54,877
Increase on Railroad	6,466	
Decrease " "		8,381
Increase on Canal		
Decrease " "		
Of the above there was transported on account of—		
Lehigh Coal Nav. Co	10,739	16,831
Wilkesbarre Coal & Iron Co	11,057	17,134
	21,796	34,015
Corresponding period last year—		
Lehigh Coal Nav. Co	6,336	14,711
Wilkesbarre Coal & Iron Co	11,458	29,942
	17,794	44,654
Increase	4,001	
Decrease		10,638

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna and Western R. R., for week ending January 15, 1872:

	Week. Tons. Cwt.	Year. Tons. Cwt.
Shipped North	12,763 05	23 058 16
Shipped South	48,262 13	86,196 02
Total	61,025 18	103,517 18
For the corresponding time last year:		
Shipped North	391 05	858 13
Shipped South	12 01	79 01
Total	403 06	937 14
Increase	60,622 12	108,580 04
Decrease		

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending Jan. 13—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct	WEEK 1871. tons ct.	YEAR 1872 tons cwt.	YEAR 1871. tons. cwt.
Wyoming Region	16874 16	17756 12	26925 05	37620 14
Upper Lehigh Region	3598 06	1544 07	6435 19	4614 06
Beaver Meadow Region				
Hazleton Region	150 09	189 10	278 18	638 17
Mahanoy Region				
Trescow Region	2092 13	432 05	3647 11	1043 03
Mauch Chunk Region	8926 07	5270 04	14313 08	13475 04
Totals	31642 02	22192 18	51671 01	55452 04
Increase	9449 04			
Decrease			3781 03	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	26749 04	20176 14	43430 04	51550 19
Forwarded East of Mch Chunk by Canal				
Delivered at and above Mauch Chunk	1727 04	1824 08	3065 05	3326 01
Delivered to L. & B. R. R.at PlymouthBridge	2796 16		4625 08	
L. V. R. R at Packer'n	377 18	191 16	550 04	575 04
Totals				
Of the above there was transported on acc'nt of L. C. & N. Co	10739 06	6336 00	16881 13	14711 11
W.-B. C. & I. Co	11057 02	11458 18	17134 00	29942 11
Totals	21796 08	17794 18	34015 13	44654 02
Increase	4001 10			
Decrease			10638 09	

Northern Central Railway,

SHAMOKIN DIVISION.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the week ending Jan. 13, 1872.

	Tons. Cwt.
East	
West	8,189 04
Same time last year	9,637 08
Increase	
Decrease	3,448 04
Total amount shipped to date, 1872	8,565 18
Same time last year, 1871	16,100 16
Increase	
Decrease	7,534 18

Huntington and Broad Top R. R. Co.

For week ending Jan. 13, 1872	7,437 tons
Same time last year	4,353 "
Increase	3,147 "
Decrease	
Total amount shipped to date	11,790 "
Same time last year	7,629 "
Increase	4,161 "
Decrease	

STATISTICS OF
THE CUMBERLAND COAL TRADE,
FROM ITS COMMENCEMENT.

Compiled from Official Sources, by C. SLACK, Mount Savage, Md.

NAME OF COMPANY OR MINE.	1871. To B. & O. R. R. Tons.	To C. & O. Canal. Tons.	Local. Tons.	Total. Tons.	Compared with 1870. Increase. Tons.	Decrease. Tons.
Consolidation Coal Company	257 276	236 994	31 257	5 05 257	121,820	.....
Maryland Coal Co	151,888	180,953	291	333,042	73,688	.....
American Coal Co	78,257	147,397	.....	225,654	23,375	.....
Borden Mining Co	98,330	107,955	1,371	207,656	59,413	.....
George's Creek Coal and Iron Co	144 131	47,948	8	192,087	113,384	.....
Hampshire and Baltimore Company (Midland)	5 446	8,606	.....	.....		
do do (National)	3,956	48,045	57	161,963	57,972	.....
do do (Virginia Mines)	94,671	.....	2,332	.....		
Midlothian Coal and Iron Company	55,320	72,162	454	127,936	91,718	.....
Virginia Coal and Iron Co	81,218	.....	.....	81,218	53 183	.....
Franklin Coal Co	80,417	.....	.....	80,417	.....	3,002
Potomac Coal Co	79,715	.....	.....	79,715	8,920	.....
Piedmont Coal and Iron Co	79,037	.....	.....	79,037	8,022	.....
Big Vein Coal Co	78,870	.....	.....	78,870	17,086	.....
Atlantic and George's Creek Coal Co	61,753	879	.....	62,632	11,867	.....
Swanton Coal Company	45,865	.....	.....	45,865	.....	8,548
Spruce Hill Coal Co	31,499	.....	164	31,663	12,257	.....
Barton Coal Co	31,478	.....	.....	31,478	.....	11,276
Lincoln Coal Co	10,739	.....	.....	10,739	10,739	.....
George's Creek Mining Co	9 564	.....	.....	9,564	2,761	.....
Cumberland Coal and Iron Company	.....	.....	.....	.....	.....	9,049
Central C. M. and M. Co	.....	.....	.....	.....	.....	4,161
Cook Mines	.....	.....	.....	.....	.....	2,151
Total	1 458,920	850,339	35,895	2,345,153	666,265	38,187
					38,187	
					628,078 Increase.	

RECAPITULATION :—By Cumberland & Pennsylvania Railroad to B. & O. R. R. 1,216,156
" " " " to C. & O. Canal. 656,085
" " " " to Local 31,123 — 1,903,364
" Cumberland Branch Road to B. & O. R. R., 65,093
" " " " to C. & O. Canal, 194,254
" " " " to Local, 4,771 — 264,118
" Hampshire and Baltimore Co. to B. & O. R. R., 96,453
" Virginia Coal & Iron Co, 81,218 — 2,315,153

1,672 Tons Gas Coal shipped during year — Total Tons in 1871,

THE CUMBERLAND COAL TRADE.
FROM 1842 TO 1871, INCLUSIVE-30 YEARS.
TABLE 2.

	FROSTBURG REGION						PIEDMONT REGION.						
	Cumberland & Pennsylvania R.R.			Cumberland Coal & Iron Co's R.			George's Creek R. R.			Hamp. R. R.			
	By B. & O. R. R.	By C. & O. Canal	Total.	By B. & O. R. R.	By C. & O. Canal	Total	By B. & O. R. R	By C. & O. Canal	Total.	By B. & O. R. R.	Total by B. & O. R. R	Total by Ches. & OCan'l	Aggregate
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1842..	757	....	757	951	....	951	....	....	....	....	1 708	....	1,708
1843..	3,661	....	3,661	6,421	....	6,421	....	....	....	....	10,082	....	10,082
1844..	5,156	....	5,156	9,734	....	9,734	....	....	....	....	14,890	....	14,890
1845..	13,738	....	13,738	10,915	....	10,915	....	....	....	....	24 653	....	24,653
1846..	11,240	....	11,240	18,555	....	18,555	....	....	....	....	29,795	....	29,795
1847..	20,615	....	20,615	32,325	....	32,325	....	....	....	....	52,940	....	52,940
1848..	37,571	....	36,571	43,000	....	43,000	....	....	....	....	75 571	....	79,571
1849..	63,676	....	63,676	78,773	....	78,773	....	....	....	....	142,449	....	142,449
1850..	73,783	3,167	76,950	119,023	875	119,898	....	....	....	....	192 806	4,042	196,848
1851..	70,893	51,438	122,331	103,868	31 540	135,348	....	....	....	....	174,701	82 978	257,679
1852..	128,534	46,357	174,891	139,925	19 362	159.287	....	....	....	....	268,459	65,719	334,178
1853..	150,381	84,060	234,441	155,278	70,535	225.813	70 560	3,165	73,725	....	376,219	157,760	533,979
1854..	148,953	63,731	212,684	173,580	92 114	265,694	181,303	....	181,303	....	593,836	155,845	659,681
1855..	93,961	77,095	171,056	99,710	100-691	198,401	221,245	6,000	227 245	65 870	478,486	183,786	662,272
1856..	86,994	80,387	167,381	121,945	105,149	227,094	250,626	18,584	269,210	42,765	502.339	204 129	706,450
1857..	80,743	55,174	135,917	88,573	50 000	142,573	344,968	7,404	252,368	51 628	462,912	116 574	582,486
1858..	48,018	166,712	214,730	66,009	87,539.	153 548	218,318	....	218 318	63 060	395 405	254,251	649,656
1859	48,415	211,639	260 054	72,423	86,203	158 626	257 740	....	257,740	47 934	476,512	297 842	724,354
1860..	70,669	232,278	302,947	80,500	63,600	144,100	289 298	....	289,298	52,564	493,031	295 878	788,909
1861..	23 878	68,3.3	92,181	25,983	29,296	55,279	85 554	....	85 554	36,660	172,075	97,599	269,674
1862..	71.745	75,206	146,951	41,096	23,478	64,574	69,482	.. .	69,482	36,627	218,950	98,684	317 634
1863..	117,796	173,269	291,065	111,087	43,523	154,610	266,430	....	269,4 0	36,240	531,553	216,792	748,345
1864..	287,126	194,120	481,246	67,676	61,522	132.198	....	....	....	44,552	309,354	258,642	567,996
1865..	384,297	285,295	669,592	104 651	57,907	165,558	....	....	....	71 345	560,193	343,202	903,495
1866..	592.938	291,019	883,957	51,251	52 159	104 410	....	....	....	90 964	736,153	343,178	1,079,331
1767..	623,031	385,249	10 8,280	40,106	72,904	113,010	....	....	....	72,532	735.669	458.153	1,193,822
1868..	659,115	424,406	1083,521	100,345	57,919	158.264	....	....	....	86,658	848.118	582,325	1,330,443
1869..	1016,777	573,243	1490,020	130,017	78,908	208 925	....	....	....	83,724	1230,518	652,151	1,582,669
				2092,657	1192 224	3,284 881	2155,524	35,149	2190.673				
				CUMBERLAND BRANCH.			VIRGINIA C. & I. CO.						
1870..	909,511	520,196	1429,707	114,404	83 941	198,345	28,035		28,035	69.988	1112,938	604,137	1,717,075
1871..	1247,279	656,085	1993,364	69,864	194,254	264,118	81,218		81,218	96 453	*1494874	850,339	2,345,153
	7030,251	4718,429	11808680	184,268	278,195	462 463	109,253		109.253	1042,264	12674217	6223,997	18,898,214

* Includes 35,894 tons used on line of Cumberland and Pennsylvania Railroad and its branches, and at Cumberland and Piedmont ; also 252,287 tons used by the Baltimore and Ohio Rail Road Company in Locomotives, Rolling Mills, &c.

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Jan. 13, and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal. Tons.	Cwt.	To B.&O.R.R. Co Tons	Cwt.	Total. Tons.	Cwt.
1872	.....		17,868 02		17,868	03
1871	.....		11,159 03		11,159	03
Increase			6,708 15		6,708	15
Decrease						

YEAR.

1872	.....		24,062 12		34,068	16
1871	.....		34,456 16		24,456	12
Increase	.....		9,611 16		9,611	16
Decrease						

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK, Jan. 21. R. A.	W. A.	AT PHILADELPHIA, Jan. 22. R. A.	W. A.
SCHUYLKILL.				
Lump	$— —	$— —	— —	— —
Steamer	4 50	— —	— —	— — 4 50
Broken	4 50	— —	— —	— —
Egg	— —	— —	5 00	— — 4 75
Stove	5 00	— —	5 00	— — 5 00
Chestnut	4 25	— —	— —	— —
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	5 00	— —	— —	— —
Broken	4 75	— —	— —	— —
Egg	4 50	— —	— —	— —
Stove	5 25	— —	— —	— —
Chestnut	4 25	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Honey Brook, Le'h W. A.	4 50@5 25		— —	— —
Spring Mountain " "	— —@— —		— —	— —
Sugar Creek " "	— —@— —		— —	— —
Sugar Loaf " "	— —@— —		— —	— —
Old Comp'y's " "	4 25@5 25		— —	— —
Cross Creek " "	— —@— —		— —	— —
Room Run " "	4 25@5 25		— —	— —
Girardville " "		— —	— —	— —
McMichael " "		— —	— —	— —
Shamokin " "		— —	— —	— —
Lykens Valley " "		6 00	— —	— —
Broad Top " "		— —	— —	— —
Hill & Harris " "		— —	— —	— —
Henry Clay " "		— —	— —	— —
Powelton " "		— —	— —	— —

*Dealers in these coals may be found in our advertising columns.

Company Coals.

Jan. 1872.

	L.	Str.	Grs.	Eg.	Sto	Chest
*Scranton at E. Port	3 45	4 00	4 00	4 15	5 00	4 05
*Pittston at Weehawken	4 60	4 60	4 80	4 90	5 20	4 60
*Lackawana at Weehawken	4 20	4 35	4 50	4 75	5 00	4 50
Wilk'b're at Hoboken	4 00	4 25	4 40	4 50	5 25	4 25
Old Co. Lehigh at Pt John's	5 00	—	4 75	4 50	5 25	4 25
Lehigh at Eliz. Port	5 00	—	4 75	4 50	5 25	4 25

For freights to different points see "Freights."

* To contractors.

MARKET REVIEW.

FOR THE WEEK ENDING JANUARY 20th 1872.

IRON—The Pig Iron market of the country seems at the present time to be in an enviable state of prosperity, quite in contrast, we are sorry to say, with some other of our industrial interests. The production of American Pig, though amounting to two million tons, is readily absorbed by our consumers, besides leaving a margin for large importations of Scotch from year to year, which also find a ready market in this country. It is a remarkable fact, and one showing the rapid increase of consumption of American Pig in the interior of Pennsylvania, that Pittsburgh alone consumes one-quarter of the whole product of the United States. With such a state of things the prospect for this interest seems indeed quite promising. We hear of further considerable movements in the Philadelphia markets, besides those mentioned in our last, and the further contracts here reach 25,000 tons, making a total within a week of over 60,000 tons, the latest being made as high as $36a37 for No. 1, and $35a35 50 for No. 2 seasons delivery. Thus since our last, prices by all the leading Lehigh Companies have been advanced $2 per ton, and considerable sales from Makers and Dealers, the latter resales, have been made at the improvement. The Allentown Company at first named their price to sell at $37 50, but a telegram yesterday announced their withdrawal from the market at present; The Crane asks $37, offering small amounts even at the advance, having sold ahead of production; the Thomas and other Lehigh Companies $37 for No. 1 and $36 for No. 2 ex. and $35 for Forge, Carbon $37, and Po'keepsie $36 for No. 1 and $35 for No. 2 ex. The furnaces on the Lehigh have no stock, an unusual occurrence at this season of the year. Forge has been in exceptionably good demand of late, and is now nearer the value of Foundry than for some years past. The greatly increased consumption of American Pig seems to have been under-estimated of late, and is now attracting much attention. In all the active movements and excitements recently noticed, it is a gratifying feature that there has not been mixed with it anything that may be called of a speculative character, the whole business having been done in a regular legitimate way for consumption. The wholesale closing prices may be quoted $37a38 for No 1, $36a37 for No. 2 ex, and $35a36 for Forge. The position of the Scotch Pig market is no less favorable than that for American—stocks here are light, the consumption large, and but little is expected for some time to come. We have cable advices to 15th inst. from Glasgow, stating a further advance of 1s.a2s. per ton there, while stocks in Scotland had decreased 175,000 tons from the beginning of the year, being now (or 1st inst.) 490,000 tons of all numbers. The year closed there 2ls. per ton over the beginning of 1871, prices there having run down on account of the Franco German war and the stoppage of shipments to the Continent in consequence. Shipments from Glasgow for the years

	1869.	1870.	1871.
To United States..tons	111,000	97,000	151,000
To British America "	31,000	32,000	58,000

The business in Scotch has been pretty large, partly on speculation, on account of the high prices advised from the other side, the apathy here of buyers for some time past having induced light shipments thence—hence the small supply now expected, and consequent speculative feeling and upward tendency of prices. The sales include 1075 tons Glengarnock at $35a$35,50, and for 75 tons $36; 100 do. Coltness, $41,50; 900 do. Eglinton, ex Bessie Crosby, said to be about $34; and 50 do. Sumerlee, $38,-50, all prompt cash. Coltness is now held at $41 and over, Gartsherrie at $40, Summerlee at $38,50 Glengarnock at $36, and Eglinton at $35, all from the wharf. We notice besides 1000 tons old Rails, sold a week ago, T and Double-head, mixed, at $41 gold, 90 days. Refined Bar from store continues exceedingly strong, with a fair demand at the advance made 5th inst. The "Eastern Iron Masters Association," met here yesterday, but the result of their deliberations did not transpire, though it was understood that no change was made in prices, and we believe the association was convened for other purposes. Sheet continues very firm at our quotations—15,000 lb. Galvanized sold to a Jobber, at 20 per cent. discount from List.

At a Convention of Bar Iron Manufacturers held in Philadelphia on the 11th inst., a resolution was adopted that any reduction in the duties upon iron would eventually close the mills and furnaces in the United States, thereby crippling all other industrial interests. A resolution was also adopted protesting against the adoption of any policy which shall retard the development of our country and place us in a condition of dependence upon foreign nations for our manufactures.

COPPER—Manufactured is very firm at 34 cents for Sheathing and 36 for Bolts and Braziers; Bronze and Yellow Metal Sheathing, and Y. M. Bolts 26 net, cash. Ingot is less active, but the advanced prices are sustained. Sales have been made of 35,000 lb. Lake at 27½a28 cents cash, and 28½ February delivery, and 150,000 lb. for February and early March delivery 28½, closing at 28 cash, and 28½ for February.

LEAD—The demand for Foreign Pig is very limited, and we hear of no business. Prices are unchanged. Bar 9¼ cents, Sheet and Pipe 10, and Tin-lined Pipe 15, less 10 per cent. to the Trade.

SPELTER—Remains firm, though the demand is small; 20 tons Silesian sold at 7½ cents gold, domestic 10 cents currency.

TIN—The demand for Pig is still very small, prices have been shaded a little, but without increasing business, and we have only to notice the sale of 50 slabs Straits at 37½ cents; the nominal quotations are, Straits 37½a37¼ cents, English 37a37¼, and Banca 41¼a41½, all gold. Cable accounts advise an advance in London on Straits of 1s.a2s., bringing the price up to £145a£146. The market for Plates continues active, and prices have further advanced: $10 gold is offered and refused for large lots Charcoal Tin, and small lots from store have been sold at $10,25a$10,50. The sales embrace 2000 bxs. Charcoal Tin at $10a$10,12½; 1350 do. Charcoal Terne, $8,75a$9; 1750 I. C. Coke, 10 by 14, B. I. and Landwit, $8,75a$9, all gold; and 500 do., 14 by 20, on private terms.

ZINC—Sheet continues steady at previous quotations, with a moderate demand, and sales of Mosselmann in lots, as wanted from store, at 9¼a9½ cents gold, net.

Manganese black oxide 3½ cents.

" " per oxide 5½ cents.

METALS.

NEW YORK, Jan 20, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ℔ lb; Railroad, 70 cents ℔ 100 lbs.: Boiler and Plate, 1½ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1¾ to 1¾ cents ℔ lb; Pig, $7 ℔ ton; Polished Sheet, 3 cts. ℔ lb; Galvanized 2½; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices
Pig, Scotch No. 1, ℔ ton	36 00@41 00
Pig, American, No. 1	37 00@38 00
Pig, American, No. 2	36 00@37 00
Pig, American, Forge	35 00@36 00
Bar Refined, English and American	— —@86 00
Bar Swedes, assorted sizes (gold)	85 00@100 00
	Store Prices, Cash.
Bar, Swedes	112 00@122 50
Bar, Refined, ord'y sizes	92 50@ — —
Bar, Refined, 1½ to 6 by ½ @ 5-16 inch	97 50@ — —
Bar, Refined, 1 & 1½ by ¼ & 5-16	100 00@ — —
Bar, Refined, 2½ to 3 Round & Square	100 00@ — —
Scroll	110 00@140 00
Ovals and half-round	110 00@130 00
Band	— —@107 50
Horse Shoe	105 00@115 00
Rods ⅜ to 3-16 inch	97 50@132 50
Hoop	112 50@160 00
Nail rod	7 — @ — —
Sheet, Russia, as to assortment (gold)	15 @—15½
Sheet, Single, D. and T. Common	—5½@— 6
Sheet, D. and T. Charcoal	— 6 @— 6½
Sheet, Galv'd, Nos. 14 to 25	20 to 30 ct. dis. 12@14c lb.
" " Nos. 27, 28, and 29	20 to 30 ct. dis. 15@18c lb.
Rails, English (gold), ℔ ton	63 00 @00 00
Rails, American, at Works in Pa	— — @71 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 34
Copper Bolts	— @— 36
Copper Braziers, 16oz. and over	— @— 36
Copper Nails	— @— 40
Copper, Old Sheathing, &c. mixed lots	25½@— 26
Copper, Old, for chemical purposes, 14@16 oz	— @— —
Copper, American Ingot	27½@— 28
Yellow Metal, New Sheathing & Bronze	— @— 26
Yellow Metal Bolts	26 @— —
Yellow Metal Nails	— @— 26

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs	$— — @— —
Spanish (gold)	5 90 @6 00
German, do.	5 90 @6 00
English do.	5 90 @6 25
Bar (net)	9 25 @ —
Pipe (net)	7 — @10 00
Sheet	— — @10 00

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ℔ lb.

STEEL.—Duty: Bars and Ingots, valued at 7 cents ℔ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 3½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.

English Cast (2d and 1st quality) ℔ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11 @— 13
English German (2d and 1st quality)	— 10½@— 12
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— 15 @— 16
American, Spring, do.	— 9 @— 11
American Machinery, do.	— 9 @— 10
American German, do.	— 9 @— 11

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent.; Roofing 25. ad val.

	Gold ℔ lb.
Banca	41¼@41½
Straits	37½@37¾
English	37 @37¼

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ℔ box	$9 75 @10 25	$10 75 @11 50
I.C. Coke	8 75 @9 25	9 75 @10 25
Coke Terne	7 75 @8 25	8 75 @9 25
Charcoal Terne	9 00 @9 25	10 00 @10 50

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign	(gold) p. 100 lb.	7 12½@ 7 50
Plates, Domestic	p. lb.	— 7 @— 11

ZINC.—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c per lb

Sheet	per lb.	10½@—11½

San Francisco Stock Market.

BY TELEGRAPH.

Our report from the San Francisco Stock market is dated the 16th inst., excepting a slight decline in Eureka G. V. the market has advanced. Imperial and Chollar Potosi figuring most prominently in the upward tendencies; on the 12th inst. Ophir sold at $14 per share; Hale & Norcross on that date changed hands at $142. Belcher on the same date stood at $475. The following is the full report:

Savage	59
Yellow Jacket	61
Kentuck	150
Chollar Potosi	46
Gould & Curry	124
Belcher	...
Crown Point	...
Ophir	...
Imperial	59
Amador	...
Eureka G. V.	18¼
Meadow Valley	...

Mining Stocks.

Gold stocks are unchanged; the sales of the Board for the week are all comprised in two transfers of La Crosse on the 11th inst. amounting to 600 shares at 18c. per share; also 400 shares of Quartz Hill on the same date in two sales at 6c. per share. The following is the full report of the Board:

GOLD STOCKS.

	BID.	ASKED
American Flag	—	20
Bates & Baxter	25	—
Benton	—	—
Black Hawk	30	—
Central Gold	—	5
Cons Gregory	15	20
Grass Valley	—	6
Gunnell	—	—
Holman	—	—
La Crosse	17	—
Liberty	—	—
Mariposa pf	—	—
Montana	—	—
Rocky Mount	—	5
Quartz Hill	—	—
Smith & Parmlee	10	—
N. Y. & Eldorado	—	—

The Petroleum list is decidedly weaker with no sales. The following is the report of the Board:

PETROLEUM STOCKS.

	BID.	ASKED.
Bennehoff Run	15	—
Bergen Coal and Oil	—	—
Bliven Oil	—	—
Blood Farm	—	—
Breevoort	—	—
Buchanan Farm	35	—
Central	58	—
Clinton	—	—
Home	—	—
National	1 00	—
New York & Allegheny	—	—
Northern Light	1 00	—
Phillips Pet	30	—
Pitnole Creek	5	15
Rathbone Oil	—	1 00
Rynd Farm	20	—
Second National	30	—
Sherman & B	—	40
Tarr Farm	—	—
United Petroleum Farms	—	—
United States	28	30
	40	50

DEPARTMENT OF POPULAR SCIENCE.

The Tones of Speech.

The lecture delivered on the 28th of December before the American Institute by Professor O. N. ROOD of Columbia College, on the subject of Sound, demonstrated to the general public (what has long been acknowledged in scientific cirles) the learning, originality and accuracy of the distinguished lecturer, and his mastery of the arts of experimental manipulation and clear explanation—each of which is rare enough, while their combination in one person is certain to make him famous and influential in this age of scientific inquiry. I do not hesitate to say, that the published report of Prof. ROOD's lecture will bear comparison with any of TYNDALL's popular scientific addresses, while the experiments with which it was illustrated were at once brilliantly successful and perfectly appropriate. Nothing is more irritating than the manner in which some lecturers lug in big or pretty or startling experiments, stringing them together upon a feeble thread of wandering talk; and nothing is more satisfactory than public experiments, skillfully conducted, and properly subordinated to the logical presentation of a subject.

Unable to give in full this admirable lecture, I select for notice one of its most striking passages, referring to the use of tones in speech. This part of the subject was introduced, after a general explanation of the sound-waves and the formation of musical tones through their successions, by an allusion to the coëxistence of different sets of waves in the same medium, as shown in the movements of water, and in the vibrations which may be communicated to a tuning-fork. Reed-pipes always give impure notes; that is, they generate not only the fundamental tone due to their length, but many other shorter sets, giving the octave, the next higher duodecime, etc. By altering the shape and size of the pipe particular notes which are present may be strengthened or weakened; and the sound thus receives a different quality without actual change of the fundamental pitch. The lecturer exhibited three reed-pipes giving exactly the same fundamental note, but differing widely in the quality of their tones, by reason of their different shape—one tune resembling a trumpet, one a haut-boy and one a clarionet.

Now the membrane in the human throat called the "vocal cords," corresponds to the vibrating tongue of a reed, and the cavity of the mouth and nose has the same functious as the pipe. We may therefore look to the phenonema of artificial reeds for analogies of the phenonema of human speech and song. From a set of artificial vocal cords, made of sheet india-rubber, the lecturer drew a series of inharmonious semi-human tones, breaking up from time to time into an inarticulate howling. Then returning to the reed-tongue (which without the pipe gave likewise, when acted upon by the bellows and varied in acting size, a series of complex, discordant notes) he added to it a short conical pipe, whereupon the quality of its sound was entirely changed, and the apparatus, when opened and closed with the hand, pronounced the words "ma, ma." The artificial vocal cords being supplied with a short, broad, slightly conical pipe, and similarly treated, uttered sounds like "Pop-par"; and a glass flask being substituted for the pipe, a distinct but somewhat nasal "Pa, Pa," was obtained. This shows that by varying the shape and size of the pipe, or the cavity and opening of the mouth, without in the least altering the fundamental note, we can strengthen or weaken particular sets of the high notes which accompany it, and thus entirely alter the quality of the resulting sound—a principle which is empirically applied by instructors and critics in vocal music (who are often heard to say of a singer that "she does n't open her mouth right") and one which underlies all pronunciation.

No successful exact analysis of the consonant sounds has yet been attempted; but HELMHOLTZ has recently analyzed the vowels and found that they consist of a fundamental note, mingled in certain proportions with notes that are higher. These are all generated by the vocal cords, but particular tones are strengthened or weakened by altering the shape, size and opening of the cavity of the mouth. Any one may demonstrate this by sounding a long note and changing the position of cheeks and lips during its continuance. He will be perfectly conscious that there is no change in the vibrations of the vocal cords, which determine the pitch, while every open vowel sound is produced in succession by the modifying action of the mouth and its cavity. HELMHOLTZ calculated the relative proportion of each harmonical to the fundamental tone in every vowel, and triumphantly verified his analysis by synthesis, actually reconstructing the vowel sounds out of pure notes, using a series of tuning forks, vibrated by electro-magnetism.

This beautiful demonstration explains the circumstance subsequently illustrated by Professor ROOD, in the well-known experiment of the "singing flame," namely, that such a flame is sensitive, not only to sounds of a certain pitch, but to certain vowels, as distinguished from others of the same pitch. Professor ROOD did not offer this explanation, but I venture the statement, which I think he would make, that in this case it is the predominant harmonical or higher accompanying tone which affects the flame. Indeed, in my limited domestic experiments with ordinary gas flames and without musical instruments, I have usually found the flames to respond to very high tones, so that prolonged enthusiastic investigations of this character are apt to bring a gentle being into the study to know what on earth I am squealing about!

R. W. R.

New Publications.

AMERICAN LOCOMOTIVE ENGINEERING AND RAILWAY MECHANISM. *With a Practical Treatise on the Material, Draughting, Construction, and Management of the Locomotive Engine and Railway Cars. Illustrated with Large and Detailed Engravings of the Newest and most Approved Engines, and Working Drawings, wherein the Dimensions are carefully marked; also Diagrams, Demonstrating the Construction of the Valves and Links, according to the Latest and Best Practice in Locomotive Works and Railroad Repair Machine Shops in the United States of America.* By G. WEISSENBORN, Mechanical Engineer, New York. Published by the American Industrial Publishing Company, 269 Pearl St.

This is a new work, issued in monthly parts, at one dollar each, and promising to supply to railway engineers and mechanics a much needed authority for instruction and reference. Mr. WEISSENBORN is favorably known as a mechanical engineer, and will receive in his important undertaking the aid of many eminent railway engineers and builders of locomotives. The letter-press of the first number is merely introductory, and we can scarcely judge from it of the character of this part of the work. We must remark, however, that in laying out the plan of his book, Mr. WEISSENBORN seems to promise too much, when he announces that he will treat thoroughly of the chemical properties of "those remarkable elements, oxygen and hydrogen," merely because oxygen and hydrogen form water, and water in the form of steam makes the locomotive go. Nor does his statement that "the base of hydrogen" has been proved to be probably metallic, and that possibly all the elements, with the exception of oxygen may hereafter turn out to be metals, augur very well for the accuracy of the chemical part of his treatise.

But this is a minor matter. The work will be mainly valuable in the department where the author is fully at home; and of this first number we can cordially say, that the beauty and perfection of the four plates, 24 by 15 inches in size, which it contains, render them abundantly worth the price charged for them. They represent the side and rear view, elevations, longitudinal and transvere sections, and entire working details of a wood-burning passenger locomotive, No. 44, built at the works of the New Jersey R.R. Co., in Jersey City, by JOHN HEADDEN, master mechanic. The drawings are upon a large and accurate scale, and the dimensions are clearly marked. We shall notice future numbers of this valuable monthly as they appear.

The Tin Mines of Missouri.

TO THE EDITOR:

For many years it has been reported in certain quarters that tin was very abundant in Missouri. A company with large capital was formed, excursions were made from time to time to the mines, champagne was drunk and speeches delivered, assays of the ore were made, and "buttons of tin," indicating a richness of from two to twelve per cent. of metal, were obtained and carried off by visitors. Men of wealth and good business habits in St. Louis were induced to take stock in the enterprise, which promised such rich returns.

About a year ago the State Geologist, in his report to the Legislature, expressed doubts whether there was any tin in the greenstone claimed by the "operators" to be tin ore. For this he came near being dismissed from the survey by the Legislature then in session, into which a resolution was introduced to suppress the report, which, it was said, so greatly belittled the mineral wealth of the State. In the excitement the Senate suspended its rules, and the House would doubtless have done the same, had it not been discovered that the report was already printed and many copies circulated. The tin men were greatly exasperated, and declared they would have the "imported" geologist ousted. A law was passed, giving the Governor, Mr. B. GRATZ BROWN, power to appoint a "Board" to manage the geological survey, which was done, and that Board, consisting of the Governor and two whom he had appointed turned out the geologist, Prof. A. D. HAGEN. About $100,000 had been expended prior to the time the geologist reported adversely on the tin. Since then at least $50,000 more has been expended in the erection of buildings, a furnace, stamps, washing apparatus, etc.

In August last the people were promised tin "in about a week." In September and October the same promise was repeated, in November and December the same. But the new year has come, and with it there come no more promises of tin. The principal "operators" have sold out and the works are shut up.

The people now begin to see that a stupendous fraud has been practiced, and thousands of dollars squandered, merely to make a show, in order to fix the market, so that they could "place" worthless stock.

The so-called tin ore is nothing more nor less than greenstone, in which there is occasionally found magnetite, which, upon being fused, produces shining globules of magnetic iron.

MISSOURI.

About Town Jottings.

FRANKLIN STATUE.

The 166th anniversary of the birth of BENJAMIN FRANKLIN was celebrated in this city on 17th inst. by the unveiling of the splendid bronze statue of the printer-philosopher, presented to the city of New York by Captain ALBERT DE GROOT, and by a dinner in the evening at Delmonico's. As was eminently appropriate, Prof. S. F. B. MORSE unveiled the statue. Before removing the flag which enveloped it, he said:

MR. DE GROOT AND FELLOW-CITIZENS: I esteem it one of the highest honors that I should have been designated to perform the office of unveiling this day the fine statue of our illustrious and immortal FRANKLIN. When requested to accept this duty I was confined to my bed; but I could not refuse, and I said yes, if I had to be lifted to the spot. FRANKLIN needs no eulogy from me. No one has more reason to venerate his name than myself. May his illustrious example of devotion to the interests of universal humanity be the seed of further fruit for the good of the world.

HON. HORACE GREELEY followed with the presentation speech, and C. C. SAVAGE, President of the Board of Trustees of the New York Typographical Society, delivered the address of acceptance, after which the immense throng, who had assembled to witness the ceremony, dispersed. The statue stands in Printing-House square, in front of the *Tribune* Building, facing the City Hall, and is centrally placed among the principal newspaper offices of this city. It is a full-length figure, in light bronze, 12 feet in height, standing on a granite pedestal of the same altitude, and surrounded by a beautiful octagonal railing, with an ornamental gas-lamp at each of the four points of the compass. The fact that this statue is entirely a home production, both in design and execution, is peculiarly gratifying.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.
Editors.

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates* of that large and powerful society, *the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees.

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Mines, Mills, and Furnaces.

This is the title of a handsome volume, issued by J. B. FORD & COMPANY, of this city, and containing the report for 1871 of the United States Commissioner of Mining Statistics. Before proceeding to notice its contents, we desire to explain, first, that the Commissioner has no pecuniary interest whatever in this edition, which is purely a matter of private enterprise on the part of the publishers; secondly, that the non-appearance up to this time of the usual Congressional edition of the same report for public and free distribution, is to be ascribed solely to the apathy of Congressmen, and not to any action or want of action on the part of the Commissioner.

Mr. RAYMOND's report was rendered in March, 1871, and the usual number of copies for the files of Congress, the departments, etc., were promptly ordered. These were long ago printed, and the whole work, in stereotype plates, is awaiting the further order, to supply the country. A resolution, authorizing the printing of fifteen thousand copies (the same number as were printed in each of four preceding years) was introduced in March, and referred, as is by law required, to the Committee on Printing. That Committee has not yet, so far as we can find out, deigned to take any action whatever on the subject. The Commissioner has written repeatedly to the chairman, without receiving any reply; members from the mining States have personally represented to the Committee the importance of prompt publication of the report, if it is to be circulated at all; but the masterly inactivity of these gentlemen has been unaffected. The case would be different, if there were any opposition to the circulation of this volume. But there is none. The universal verdict of Congressmen is, that their constituents demand it more eagerly than they do any other public document; and the vote in favor of printing the extra editions of its predecessors has been always practically unanimous.

The Commissioner, of Mining Statistics, who is accustomed to strain every nerve to secure the early preparation of these reports, is naturally disheartened and indignant when their distribution is thus wantonly and unneccessarily delayed. But he washes his hands of all responsibility in the matter, considering that the faithful discharge of his own duty leaves him no time to hang around Washington, beseeching Congressmen to attend to theirs.

Meanwhile, the publishers to whom we have alluded, exercising the common right of all citizens with respect to public documents, have issued this report in very handsome style; and those who cannot afford to wait upon the slow movements of torpid committees will be grateful for this opportunity of obtaining it.

Like Mr. RAYMOND's previous reports, "The Mines of the West" and "American Mines and Mining," this one is divided into several parts, separating to some extent the temporary and current information from that which possesses permanent professional or scientific value. Thus Part I. describes the condition of the mining industry and its history for 1870, in California, Nevada, Oregon, Idaho, Montana, Utah, Arizona, New Mexico, and Colorado. The chapter on Arizona is mainly the work of the Deputy Commissioner, Mr. A. EILERS, who personally traversed that Territory to collect the materials; and it undoubtedly constitutes the most complete and accurate account of the subject ever published. The chapter on California reflects great credit upon Mr. W. A. SKIDMORE, the agent for that State, whose industry and judgment have done wonders with the very small pecuniary means which the Commissioner was able to allow him. The other chapters give an interesting review of the progress of our Western communities, and incidentally bear pleasant testimony to the generous co-operation of the best citizens in this important work.

Part II. deals with metallurgical processes. Those who have criticised former reports of this series as deficient in one or another professional topic will now begin to see that it is not (as indeed it could not well be) the Commissioner's plan to furnish annually a text-book on the whole subject of mining and metallurgy. The report of 1869 (Mines of the West) dealt chiefly with the history and principles of mining law; that of 1870 (American Mines and Mining) devoted most space to the mechanical appliances of mining; the present volume makes prominent the subject of milling and smelting, taking up in succession the Colorado stamp-mill process, the Washoe pan-amalgamation, chlorination, and the smelting of silver ores, and giving, at the end of this part, a list of the stamp-mills of the country.

Part III. contains miscellaneous matter, concerning Narrow-gauge railways, the Mining Law, etc., and concluding with a careful chapter on the Bullion Product, in which the Commissioner explains and defends the method he has adopted in making up his estimates of the gold and silver annually produced. We append, without further discussion at this time, the corrected estimate for 1869, and the estimate for 1870, the latter of which, we believe, has never yet been published:

	1869.	1870.
California	$22,500,000	$25,000,000
Nevada	14,000,000	16,000,000
Oregon and Washington	3,000,000	3,000,000
Idaho	7,000,000	6,000,000
Montana	9,000,000	9,100,000
Colorado and Wyoming	4,000,000	3,775,000
New Mexico	500,000	500,000
Arizona	1,000,000	800,000
Utah	——	1,300,000
All other sources	500,000	525,000
Total	$61,500,000	$66,000,000

This agreeable evidence of progress will be doubtless made more emphatic by the returns for 1871 which, though not yet complete, indicate a considerable increase in production.

Sterry Hunt.

ALL American disciples of science will rejoice at the news that Dr. T. STERRY HUNT has accepted the chair of geology in the Massachusetts Institute of Technology. A son of New England by birth, Dr. HUNT has been for many years an exile from his native land, though not under circumstances of particular discomfort or woe. Certainly the world has treated him well; the laurels which he won in his youth have clustered more and more thickly around his prime; and he returns to abide among us, bringing with him a ripe and fruitful fame. We say candidly, that in our opinion his strongest points are not the ones which controversy has made most prominent. Many persons who know of him as a brilliant theorist are perhaps not aware of his remarkable familiarity with all the technical applications of science in chemistry, mining and metallurgy, of which his recently introduced and highly successful copper-extraction process is an illustration. But all these qualities could be exhibited in Canada, as well as here; literature and invention and scientific research have no nationality. What we gain by his return to this country for permanent residence, is the advantage of his personal teaching at the institution which has secured his service, and the great social pleasure of his more frequent intercourse with his professional brethren—a term which is synonymous with his friends.

The Massachusetts Institute of Technology, by the way, is one of the most vigorous, successful and progressive scientific schools of the country. We learn that the number of students this year is 262, an increase of 38 over last year. A complete set of California machinery—breaker, stamps, pans and buddles—has recently been procured and is now erecting, by means of which practical instruction can be given to the students in matters with which graduates are usually too likely to be unfamiliar. This department is under the joint direction of Professors ORDWAY, ROCKWELL and RICHARDS.

A New Tin Scrap Process.

We have received from CRAGIN BROTHERS & COMPANY, one of the leading hardware houses of Chicago, a specimen of crystallized foliated iron, produced from 112 sheets of tin-plate, which passed through the great fire, and were deprived of their tin coating by the intense and prolonged heat, crystallized and half welded together. The firm suggests, as a new process for utilizing tin scraps, that they be put in a six-story building, with a wholesale liquor store on one side and a varnish factory on the other, and that all these establishments be subjected to a temperature sufficient to burn them up in fifteen minutes. This operation will cause "the tin" to disappear from the sheet-iron—and from the owner's pockets likewise.

Systematic Preparation of Mineralized Ores by Dry Crushing and Concentration.

The problem involved in the above heading is almost novel to the industrial mining interests of this country. Hitherto dry crushing has been resorted to only for special purposes, such, for instance, as when the pulverized ore was to be furnaced, hence the machinery and methods of preparations have mainly been such as used in the wet processes of reduction, with only such modifications as were deemed essential. Although every practical operator concurs in condemning the stamp mill as most expensive when producing dry work, yet but a very limited advance has been made to supplant it, and consequently nearly all estimates of costs for dry work are based upon the experience gained in employing the stamps for this purpose. Metallurgists and writers on operative metallurgy constantly fall into this way of calculating, aided, very probably, by an educated preference for the customary practice of wet crushing and wet separation or concentration afterwards, when required. The preparation of mineralized ores (meaning a combination of worthless and valuable mineral) in the wet way undoubtedly commenced with ores *not* containing any of the precious metals. For these, wet crushing was the most economical, unless cornish rollers were used, and in either case a wet separation was the most natural, very efficient, and certainly the cheapest method. When it became essential to concentrate ores *containing* the precious metals, metallurgical invention, whether theoretical or practical, most naturally turned into the wet groove, and devised theories as well as methods of concentration adapted to the customary mode of wet crushing, or such inventors naturally sought to improve the wet methods of separation in use, so as to obtain the precious metals from mineralized ores. Germany took the lead in this matter, and German metallurgists have pursued it with that persistence and thoroughness which gains for them a pre-eminence as scientists all the world over. In respect to this, as in many other metallurgical systems, both the English and the Americans have been but copyists. Rittinger deservedly stands at the head of the list, as having produced the most perfected machinery, the most satisfactory results and the most comprehensive adaptation for the successful concentration of ores having the widest difference in their constitution or combination. Accordingly RITTINGER's system, published papers and drawings, have, as they most deservedly should, a powerful influence in the education as well as the practice of operators in England and in America. So great and exclusive is this influence that the writer has yet failed to meet an American educated in any of the excellent mining schools of Germany who would impartially investigate any system for the preparation of mineralized ores by dry crushing and separation. Nothing discourteous is intended by these remarks. Both COPERNICUS and GALLILEO got themselves into trouble by teaching theories different from those held by the learned of their times, and doubtless these learned men were most excellent men. The force of education is rightfully a powerful force, conservative and always safe, but when saying this, it does not follow that what is, is not only the right, but exclusively the only right system. For the purpose of aiding in giving a new direction to inquiry and investigation on this important subject this paper is written, to be followed by others intended to demonstrate the practicability and efficiency of dry crushing and separation as a preferable method, especially for mineralized ores containing the precious metals.

Touching this subject it may be justly said that all methods for the concentration or separation of ores holding gold and silver are novel in this country, so little has been practically done in this most important step connected with the saving of those metals closely. The constitution of most gold ores in California, where the closest study has been given to methods of close extraction, did not require, during the early days especially, any other method than battery crushing and amalgamation. A long period, therefore, elapsed before attention was directed to efficient means for collecting the sulphurets, and only when home means were provided for their subsequent treatment for the bullion. This was hardly ten years ago, within which some progress has been made, but mainly in the direction of providing a device to be placed at the mill tail. HUNTER, HUNGERFORD, WHEELER, and perhaps other names are familiarly connected with such devices. Aside of these, the most commonly used method is the sluice and blanket. But notwithstanding the readiness and inexpensiveness of these appliances, there is much well-founded complaint made concerning the loss of gold at the flow of the mill for the want of proper means of concentration. Heavily sulphuretted ores are not common in that state, at least such ores are seldom treated, and this may account for the lack of a systematic method of separation, calculated for a closer working of the ores. The writer is not unfamiliar with these appliances and therefore has no hesitation in saying that they would be of no practical value in Colorado and generally unsuited to the ores of the South. Mr. KUESTEL has contributed considerable information on this subject, by compiling and condensing from German authors, but in the main there is no American system, either by adoption or original invention, for systematically concentrating the ores of gold and silver in this country. The field is mostly uncultivated, and yet there is none more inviting to properly directed enterprise. It is within bounds to say that the almost unproductive gold mines of the South could be made to return handsome revenues, was this subject properly comprehended and an efficient system employed. In Colorado, the almost barren results of the last ten years may be attributed to the gross waste of metal, because no system of concentration was originally adopted, and that which is now used so sparingly can be termed only a makeshift, suited to the slovenly habits that prevail. These, such as they are, come into play only after a loss of not less than 20 per cent. has occurred in the mill flow, and in the use of the buddles, a further loss of from 50 to 60 per cent. of what remains is inevitably sustained. There the adoption of a proper method of separation is a question of profit and loss, or more strongly, of salvation or ruin to the country. Excuses there are, but there is no justification for the persistence in a *no method* because it is easy. The bullion shipped costs all or nearly all it is worth, the profits, as an industry, flow away in the stream, and these profits should equal the bullion shipped annually.

G. W. BAKER.

Car Propulsion by Pneumatic Power.

BY JAMES A. WHITNEY, MECHANICAL ENGINEER.*

LONG after the sucess of Stephenson's engines was assured, and the superiority of locomotive traction to that of ropes actuated from stationary engines fully demonstrated, there were not wanting projectors and engineers who sought, at much cost of invention and of money, to substitute the now universal mode of railway propulsion by one in which the traveling motor should be dispensed with. Nor were these without plausible argument, nor have their efforts, unfruitful in their time, been unproductive of much that may be of value now and hereafter. The original cost of a locomotive, as compared with that of a stationary motive power, is approximately as five to one; it requires a fireman as well as an engineer, while an ordinary stationary engine is well cared for by a single attendant; it cannot ascend steep grades, and in wear and tear is subject to rapid and often to dangerous deterioration, even with a degree of attention which with most fixed engines and steam-generators is unusual. Add to this that the economy of fuel is much greater with the latter than the former, and that fuel of poorer quality may be used, and there is good reason apparent for the numerous plans for transferring the power derived from the steam-engine by some other agency than that of direct connection by pitman, crank, and axle. Foremost of these projects has been that of using atmospheric air under pressure, which has been proposed in many different forms. In open country and in direct competition with the locomotive system, it came to grief in every instance. This was not wholly a result of any engineering or mechanical objection—although such were not wanting, for a line between Paris and St. Germain was open to passenger traffic for a period of fourteen years—but on the score of expense, which was found excessive.

But it must be remembered that the experiments commonly held to have settled the impracticability of the system were prosecuted under conditions the most favorable to steam locomotion as ordinarily defined. In the exigencies, however, of the present as concerns passenger traffic in large cities, circumstances are wholly changed. On account of noise, of smoke, of the frightening of horses, and of uncomfortably heating the vehicles in summer, steam cannot be used to advantage on city or street cars; neither, for several of the reasons just noted, should its use be attempted in tunnels; neither, on account of the vibrations incident to a locomotive, should such be allowed on elevated ways, in which the permanent stability of the supporting structure must largely depend on the absence of disintegrating causes like that just mentioned, and on which the dangers of leaving the track, of collisions and the like, would, under the stress of crowding of city transit, be largely in excess of those experienced on common railways. It is acknowledged that horse-power is already inadequate to the needs of New York City street railways; the transmission of power by wire ropes, as illustrated in the elevated railway on Greenwich Street, has proved a mediocre and insufficient method of propulsion; and in pneumatic power alone does there appear to be promise sufficient to justify the outlay that will be required in thoroughly testing any improved system of propulsion. We use the term improved as distinct from the term new, for the plans which offer the most of utility are in the essential principles quite old, some older than the locomotive itself, and the modifications which will render them practicable will, quite likely, be in themselves very slight. But the importance of little things cannot be overestimated in adapting an engineering principle to practical use. It was the adoption of the grooved rail, permitting the flanges of the car-wheels to keep them on the track while the surfaces of the latter lay flush with the street surface so as to offer no impediment to ordinary vehicles, that rendered street railways practicable. Had it been attempted to retain the T-rail, the city tramways, enabling two horses to draw five times as much as the team of an omnibus on a Broadway pavement, would not, as they have done, gridironed every large city in this country, made their way as an evidence of American enterprise into the capitals of Europe, and trailed their iron length along the streets of Stamboul, as it is stated they are now about to do. A careful working out of the details in the apparatus employed, the adaptation of one or the other variety of pneumatic propelling mechanism to the precise conditions most favorable to its success, and the application of more efficient means in the prosecution of the work than was possible with the inferior work-shop practice of forty years ago will, we have faith, bring about a practical change in city and suburban locomotion ultimately valuable in every city having more than fifty thousand inhabitants in the civilized world. To suggest methods by which, as the writer believes, this may be most readily and effectually brought about, is the object of the present paper.

Propulsion by pneumatic pressure may be properly divided under three heads, viz., that embracing the driving of a car or carrier bodily through a tube, either by an air-blast behind it, or by pressure induced in rear by a partial vacuum in front; that in

* Paper read before the New York Society of Practical Engineering, Jan. 3 1872.

which a piston, operated in the same manner as in the former, but in a tube of smaller diameter, is connected to a car running on rails outside, and that in which air under compression is admitted to engines in lieu of steam, the engines being thus actuated to turn the wheels of the vehicle by appropriate connections. In the first, a low pressure acting on an area, if anything, larger than the cross-section of the car is used; its greatest disadvantage is that, as hitherto applied, the car has been projected in darkness through a subterrene tube, reliance being had mainly upon artificial illumination. The second requires a comparatively high pressure, acting upon an area proportionally smaller than the car section, and the cause of its failure after long trial was the leaking of the longitudinal valve, whereby connection was allowed between the piston and the car arranged externally. The third is simply the use of air springs, in which power is stored by compression, to be slowly given out as the air is passed to and through the engine cylinders: among the objections attending its use is the difficulty of maintaining a uniform pressure in the supply to the engine; but of much more practical importance is the liability to freeze, induced in the engine from the heat rendered latent by the expansion of the air. These, the just enumerated principal defects incident to each modification of the pneumatic system, do not seem, in either case, to be beyond the reach of remedy, but in none does the theory or practice of such remedy appear to have been properly wrought out with special reference to the peculiar needs and conditions of city passenger transit.

The several varieties of pneumatic propulsion appear to have grown out, as it were, one from another, in a kind of natural sequence. It is sixty-one years since JAMES MEDHURST, in England, proposed to drive cars by an air-blast through a brick tunnel, furnished with longitudinal ledges to support the rails upon which the car-wheels were to run; it is presumed that the air-current was to be produced by an apparatus similar to the blowers used in iron furnaces of that time. Fourteen years later, JAMES VALLANCE patented a plan in which the air was to be exhausted in front of the car, and from the two it was but a step to combine them in such manner as to secure a maximum of speed. Apparently reflecting upon the evident objections to a tunnel railway, Medhurst, in 1827, seventeen years from the date of his first project, planned what is really the germ of the second sub-system. This comprised a tube submerged throughout its length in water, and with an opening longitudinally in its under side, from each edge of which flanges projected downward, so that a water lute of several inches depth was provided to the opening. A piston, propelled by atmospheric pressure, was to traverse within the tube, and, connected by a thin metallic blade or bar with the train upon the external track above, would propel the same. The idea, impracticable in this form, was taken up by HENRY PINKUS, who made the longitudinal opening in the upper part of the tube or main, and placed in appropriate relation thereto a flexible rope to serve as a valve. As the piston—moved by the pressure behind, obtained by the action of air-pumps exhausting in front of the piston—moved forward, it lifted the rope or valve to permit the passage of the colter or connection between the car or cars outside and the piston within. Although the external pressure of the air upon the valve was calculated to keep the latter in place, it was found to leak badly, and the plan amounted to nothing. In 1839, SAMUEL CLEGG patented, in England, a valve adapted to the longitudinal slot of the tube, and remarkable for the ingenious adaptation of its structure to the end proposed. The valve was "made of a double strap of leather or rawhide riveted between two iron plates, the top plate wider than the slot or opening, and the lower one falling into it when the valve was closed, thus completing the cylindrical form of the interior of the pipe, which had been destroyed by the aperture cut in it." One edge of the leather was allowed to rise, the other being screwed down firmly to the surface of the pipe. The lifting edge lay, when closed, against a composition of beeswax and tallow, placed on the edge adjacent and serving as a solder. The leading carriage of the train carried a trough filled with burning charcoal, and having a blade of copper projecting downward from it. This blade, being kept continually hot, and coming in contact with the valve after the passing of the colter, melted the waxy composition, and cemented the lifting edge of the valve firmly to its seat, thereby hermetically closing the tube to provide for the passage or propulsion of the succeeding train. Samuda combined with this a method of dividing the tube into sections of any desired length, and separated from each other by valves. These valves were actuated each by contact of the leading car on an external lever connecting with the pivotal bearing of the valve. This enabled a vacuum to be maintained separately in each section to propel the train its entire length, without interference with the movement of a train on any adjacent section. Means were also provided for stopping the car by air cushioned in the end of each section on the closure of the valve, independent of the movement of the train. Such was the construction of the celebrated atmospheric railway of thirty years or thereabouts ago, lines of which were laid, as previously intimated, in France, between Paris and St. Germain, and in Ireland between Kingston and Dalkey, and which, in one instance, where the leading vehicle of a train became accidentally detached, showed its capability of propelling a single car at the rate of seventy miles an hour.

TO BE CONTINUED.

MINING SUMMARY.

California.

ANNUAL REPORT OF THE IDAHO MINING COMPANY.

From the Grass Valley *Union* of Dec. 19.

The following is the Annual Report of EDWARD COLEMAN, Superintendent of the Idaho Mining Company, rendered at the meeting of the stockholders which was held yesterday evening at the office of the Company, FINDLEY & Co's Bank, Grass Valley. It will be seen that the Idaho makes a splendid showing. One item of expense for the last year will not occur again, to-wit: the sum of $14,919 45, which was expended to quiet the title of 300 shares of stock. The Secretary's Report is full in all maters relating to the mine. The Report is as follows:

To the Stockholders of the Idaho Mining Company:

GENTLEMEN:—During the past year we have run 1057 feet of drifts, sunk 79 feet of shaft and raised 145 feet of winze.

In my last report I informed you the 400 foot level was worked out. Since then however, we have struck good mill ore east of the shaft, and have opened the level through 122 feet of ledge which I estimate will average as good an average as that of the last year; and the end of the drift still looks encouraging.

The 600 east level is in 460 feet from the shaft, and still in pay rock. The 600 west drift is in 266 feet from the shaft; and the 700 west drift is in 25 feet from the shaft.

The new shaft is completed 48 feet up from the 200 level, and a small working shaft is through to the surface.

The amount of rock crushed during the year is 11,133 tons, of which 729 tons came from the 400-foot level, 1478 from the 500 level, 8382 from the 600 level, 69 from the 700 level, and 475 form the shaft. Giving a total yield of

Bullion	$385,017 90
92 tons of Sulphurets	10,041 23
Specimens and tailings	296 50
	$395,355 63

Or an average of $35 50 per ton.

MILL AND MINING ACCOUNT.

Surface labor	$20,767 75
Underground labor	66,988 93
Miscellaneous expenses	26,373 79
	$113,630 47

Or an average of $10 20 per ton.

SULPHURETS ACCOUNT.

Labor and expense of working	$4,229 00

CONSTRUCTION ACCOUNT—NEW SHAFT.

Labor, materials, etc.	$11,466 87

DRAIN TUNNEL.

Labor, etc.	$391 25

DRIFTING 350 FEET IN 200 LEVEL AND SINKING 45 FEET OF WINZE.

Labor, lumber, etc.	$5,241 00

REPAIRING ACCOUNT.

New cylinder for mill	$ 515 02
Labor etc. in retimbering shaft	2,277 50
" " " drifts	2,952 50
	$ 5,745 02
Law expenses	14,919 45

GENERAL ACCOUNT.

For purchase of ranch, claim, insurance, taxes, etc.	$13,564 10

RECAPITULATION.

EXPENDITURES.

Mill and Mining account	$113,630 47
Sulphurets	4,229 00
Construction—new shaft	11,466 87
Drain tunnel	391 25
Drifting 350 feet in 200 level and sinking 45 feet winze	5,241 00
Repairing account	5,745 02
Law expenses in defending title to 300 shares of stock	14,919 45
General account	13,564 10
Dividends—$75 per share on 310 shares	232,500 00
	$401,687 16

RECEIPTS.

Cash from last year	$ 11,358 40
From bullion on hand last year	7,070 18
14 tons sulphurets on hand	1,446 76
Proceeds from 11,133 tons of quartz crushed during the year	385,017 90
Proceeds from 92 tons of sulphurets	10,041 23
Specimens and tailings	296 50
Water	650 00
Scrap Iron	13 84
Charcoal	75
Pump column	64 00
Lease of gravel mine	200 00
J. W. GASHWILER	2,500 00
Total receipts	$418,659 56
Expenditures	401,687 16
Cash on hand	$ 16,972 40

Nevada.

PHOENIX SILVER MINING CO.

From the Eureka *Sentinel* of Dec. 15.

Among the many valuable mining properties in Eureka Mining District we can safely place that owned by the Phenix Silver Mining Company in the front rank. Through the courtesy of Assistant Superintendent P. H. B. SMITH, we were favored with an opportunity of examining the various mines belonging to the company.

THE OTHO MINE

was among the first of the extensive group of mines, bearing ores adapted to smelting, found in this district, and was purchased by Superintendent G. H. WILLARD from the original locators, in the early days of the company. Since the purchase the mine has been opened by an incline shaft, now measuring 95 feet in depth, which in its downward course, reveals several distinct veins or strata of ore, varying from one to eight feet in width, and containing mineral, working from $60 to $80 in silver and 40 to 60 per cent. of lead. The vein at the 40 foot level, has been followed 119 feet westerly and 100 feet easterly, showing splendid bodies of ore, pitching north. Large quantities have been left exposed in readiness to be taken out at short notice, when needed. On the dump we found 250 tons of assorted smelting ores.

THE JENNY LYNCH

is situated immediately above the Otho, and is supposed to be a continuation of the same veins as found in the latter, and was worked by an incline shaft, sunk from the croppings, and shows a continuous body of mineral from the surface to a depth of 56 feet, at which point a level was started and run a distance of 50 feet easterly in a vein of ore, varying from one to six feet in width. The total depth attained on this shaft is 98 feet, at which point a level has been run 31 feet easterly on the vein, where a splendid body of ore has been struck, on which work is now being vigorously prosecuted. Here it may be mentioned that this is the richest body yet found in this mine. The various ramifications of the veins found in this mine are singularly erratic, as, never following a straight course, they shoot off at all sorts of angles; but are easily tracable by the peculiar appearance of the lime and iron rock, which seems indicative of the precious metals. A vein or formation of talc was struck at one point of this mine and followed a long distance, but gave place, at last, to soft iron rock, which fact was hailed

with delight by the miners as being sure indication of the near vicinity of the mineral. The vein of ore runs nearly east and west, pitching toward the north and at an angle of 42 degrees. The value of the ore taken from here varies from $50 to $60 per ton in silver, with 40 to 60 per cent. of lead. There are now 175 tons of assorted ore on the dumps, and the mine is opened in such a way that hundreds of tons of ore can easily be extracted in a short time. A shaft is being sunk near the Otho and Jenny Lynch mines which is intended to strike the vein and facilitate the raising of the ore to the surface.

THE EMPIRE MINE.

This location is in the near vicinity of the General Lee Consolidated, Wide West, and other famous locations on Adams' Hill, and contains hard milling rock of very high grade. In the shaft a splendid body of ore is revealed, showing a width, at this writing, of four feet, valued at from $100 to $400 per ton in silver, and rich in gold. The average assay value of the ore taken from this mine has thus far been over $100 per ton. The great value of this property to the company consists in the extraordinary richness of the mineral, which, being mixed with the smelting ores of the other mines, makes rich bullion.

THE ADAMS AND FARREN MINE

is, probably, one of the best properties in the district. In the early working of this mine, an incline was sunk some 150 feet, in ore all the way, except for a distance of 30 feet, when the work was abandoned, and a perpendicular shaft was commenced. At a depth of 100 feet, a vein of ore was struck, averaging $60 to $80 per ton, proving, on exploration, to be of great extent, and, on continuing down from this level to the depth of 200 feet, several veins of ore have been cut, varying in width from 3 to 12 feet. An ore channel has been gone through for a distance of 100 feet, interspersed with veins of ore running through and permeating the earth, darting here and there, but easily traceable from the character of the formation surrounding them. We can compare this formation, or net-work of veins, to nothing more applicable than a river, winding and meandering through miles of country, which, by following a straight line, will be crossed many times; thus, by running levels where ore is struck in the channel referred to, the vein is lost and found repeatedly. But, at no time, from his knowledge of the formation, as described, has Mr. STUART, the foreman, been at a loss where to drift for ore. Many pages could be written descriptive of this mine, but a newspaper article does not afford room for prolonged description; suffice it to say, that, in our experience, no better or more promising property exists in Eureka district than the Adams and Farren. The various departments connected with the mine are in complete condition and everywhere is visible the effect of systematic working.

THE FURNACE.

There is now one furnace in complete running order, and another is being built, which can be put in operation in ten days. Within the last few weeks, extensive improvements and additions have been made in and about the works, and when next started, great quantities of bullion will be produced. New machinery has recently been added, consisting in part of an engine of 28 horse power, with a 44 inch boiler, as well as all the necessary adjuncts which go to make up a complete establishment in this line of business. We are informed that it is the intention to start the furnace on or before the 20th of the present month. In conclusion, we must say that, through the undoubted energy and ability displayed by Mr. WILLARD, the Superintendent, and his worthy associates, in the handling of this property, the owners in the Phenix stock are possessed of as fine a property as can be found anywhere in Nevada.

HUMBOLDT COUNTY.

From the *Silver State* of Dec. 16.

It is understood that Captain Page, owner of the Oreana Smelting Works, and the Montezuma mine, has sent forward a large amount of material, from below to be used at the smelting works at that place. There is no doubt but what the Montezuma mine can be made to pay handsomely if properly worked.

At a depth of 110 feet, on the incline at the south end of the Arizona Tunnel, the ledge has increased to full four feet in size, and is composed, all through, of a very fine quality of ore. The owners of the Arizona mine are feeling quite jubilant over the improved condition of their property.

The roasting furnace, at the tailings mill of the Arizona Company, was fired up on Thursday, and is now in successful operation. We are not, however, able to give any results, as it was not fully heated and in complete working order until yesterday, too late for results this week.

Advertisements.

The special advantages of the ENGINEERING AND MINING JOURNAL, *as a medium for advertisers, are so great and so widely known that it may seem almost needless to call attention to them. It is extensively circulated among the engineers of the country and takes a position in this respect before any other publication of the kind. It has a large and constantly increasing circulation among miners and mine owners, and men connected with mining operations generally. As it is the only paper in the country that makes this subject a specialty it has this field entirely to itself, and is the only direct and reliable means of reaching this class of persons. Being kept on file by almost every subscriber, it is doubly valuable as a permanent means of keeping an advertisement before the public. It is the Organ of the* AMERICAN INSTITUTE OF MINING ENGINEERS, *and is regularly received and read* BY ALL THE MEMBERS AND ASSOCIATES *of that large and powerful society,* THE ONLY ONE OF THE KIND IN THIS COUNTRY. *It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees. It is the recognized organ of the coal trade, and is taken extensively by the trade throughout the country, and presents the very best means of reaching that very important class of men.*

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TO LET for a term of years. A *Black Lead Mine* of superior quality—with machinery and everything complete to work the same—within 25 miles of New York, and railroad and canal communication close to the premises. Apply to or address
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New Central Coal Company

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GEORGE'S CREEK CUMBERLAND COAL

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THE DESPARD COAL COMPANY OFFER THEIR Superior DESPARD COAL to Gas Light Companies throughout the country.

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Company's Office, No. 29 South st. }
AGENTS:

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Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York; Metropolitan Gas Light Co., New York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C. Portland Gas Light Co., Portland, Maine.

☞ Reference to them is requested. may30-1y

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The entire Map is from

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A portion of the expense of preparing this Map was defrayed by the

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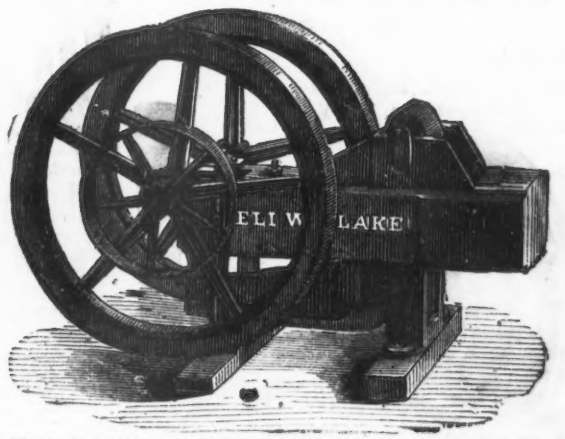

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☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

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May 17-1y

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OXIDE OF ZINC, SPELTER, SHEET ZINC.

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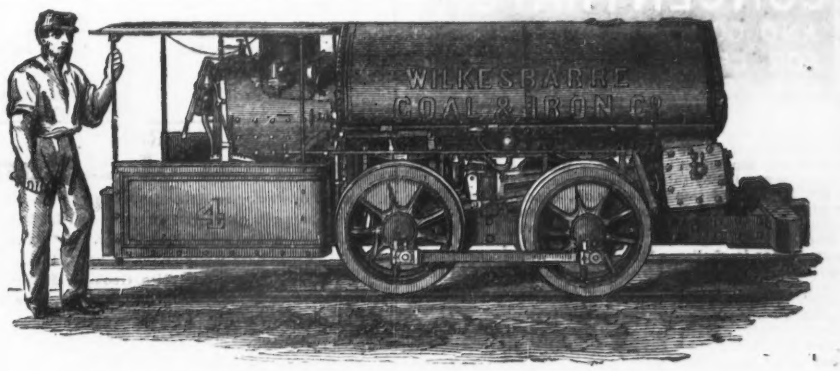

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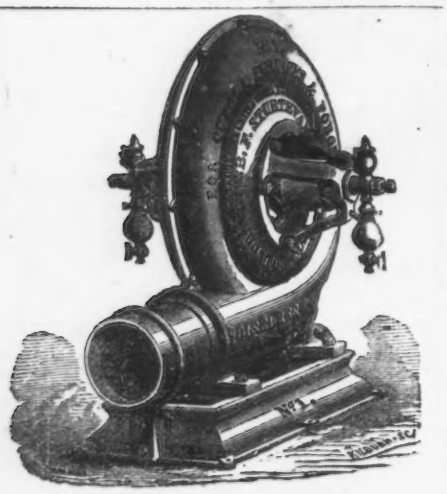

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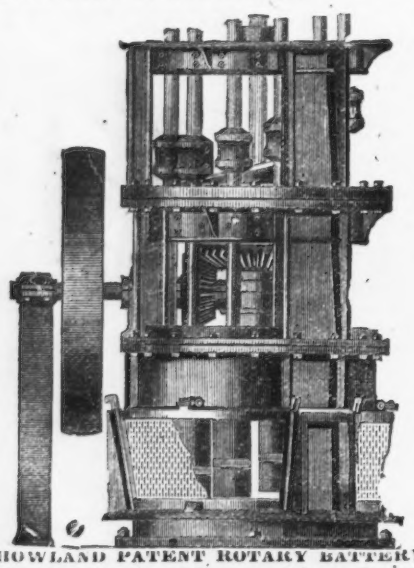

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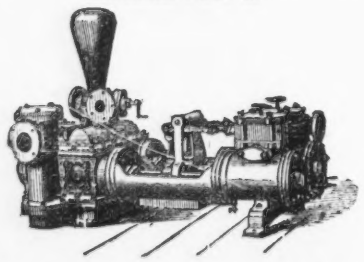

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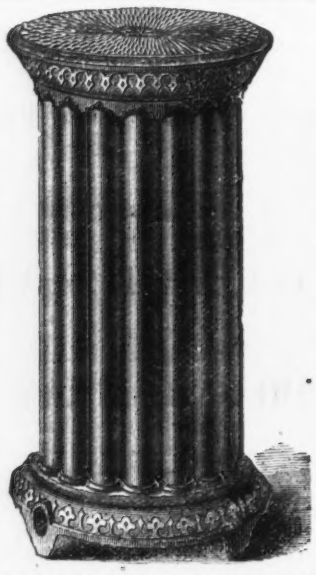

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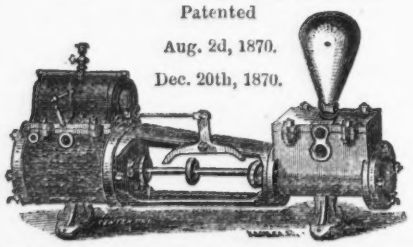

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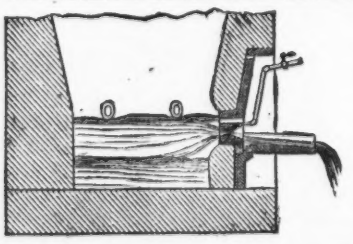

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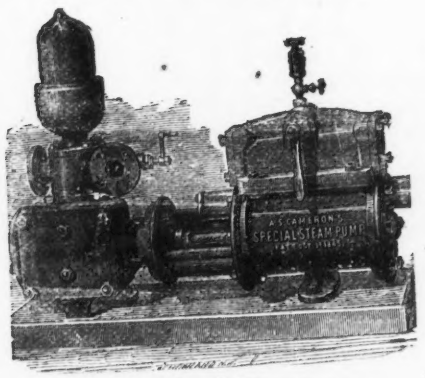

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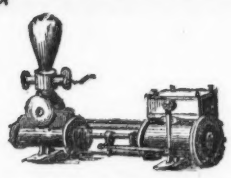

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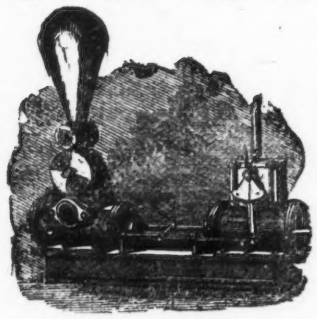

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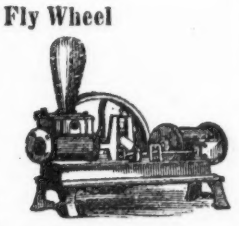

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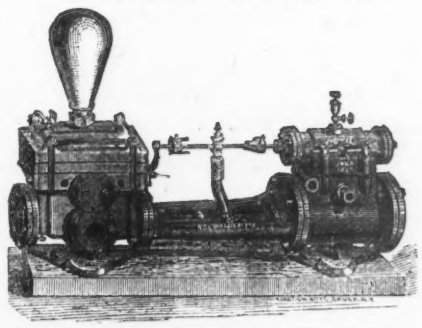

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